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Numbers, Proportions, and Natures of Conditions that are Diagnosed for the First Time Within Six Months Before Retirement, Active Component, U.S. Armed Forces, 2003-2009

In October 2010, the MSMR identified and characterized the illnesses and injuries that were diagnosed at relatively high rates among active component military members during the six months before their retirements after 20 years of service.[1] Within 6 months compared to 18-24 months before retirees left service, incidence rates were higher for approximately two-thirds of all illnesses and injuries (ICD-9-CM 3-digit code) that were diagnosed among them. Hearing loss, tinnitus, sleep disorders, low back pain and knee problems were the conditions with the largest rate differences between "pre-retirees" (within 6 months of retirement) and their counterparts still in active service.

This report estimates the numbers, proportions, and natures of illnesses and injuries that were diagnosed for the first time (since 1998) within six months of retirement among active component service members.

Methods:

The surveillance period was 1 January 2003 to 31 December 2009. The surveillance cohort ("retirees") included all individuals who served at least 20 years in an active component of the Army, Navy, Air Force, Marine Corps or Coast Guard and ended their military service during the surveillance period. Service members were excluded from the analysis if they were deployed or hospitalized within six months of their retirements.

For each retiree, all diagnoses of an illness or injury (ICD-9-CM: 001-999) that were reported during outpatient medical encounters (in U.S. military medical facilities and from purchased care providers) within six months prior to their retirement dates were ascertained from records routinely maintained in the Defense Medical Surveillance System (DMSS). For each retiree, only one diagnosis of each illness and injury (ICD-9-CM 3-digit level) was included in summaries of medical experiences within the last six months of service (referred to in this report as the "pre-retirement period"). Diagnoses of sleep disturbances (i.e., unspecified sleep apnea) classified under "general symptoms" (ICD-9: 780.5) were reclassified as "organic sleep disorders" (ICD-9: 327) for summary purposes.

For each retiree, an illness or injury was considered "previously diagnosed" if the corresponding 3-digit ICD-9-CM code was reported on a standardized record of an ambulatory encounter any time between 1 January 1998 and the start of the retiree's pre-retirement period. As such, periods of observation during which "previous diagnoses" could have been documented varied from five years (retired in 2003) to 11 years (retired in 2009). The proportions

of all illnesses and injuries that were diagnosed during the pre-retirement period that had not been diagnosed since 1 January 1998 were calculated overall and in various military and demographic subgroups.

Results:

Between 2003 and 2009, 206,591 service members ended their military careers after at least 20 years of creditable

Table 1. Demographic and military characteristics of service members who retired with at least 20 years of active service, active component, U.S. Armed Forces, January 2003-December 2009

	Service members who retired after 20 years of service, 2003-2009[a]		Retirees with a "first time" diagnosis[b] within 6 months before retirement	
	No.	%	No.	%
Total individuals	206,591	100.0	148,860	100.0
Age (years)				
<40	38,286	18.5	25,168	16.9
40-44	98,580	47.7	70,113	47.1
45-49	48,945	23.7	36,876	24.8
50-54	16,674	8.1	13,340	9.0
55-59	3,399	1.6	2,785	1.9
60-64	645	0.3	525	0.4
>64	62	0.0	53	0.0
Service				
Army	58,435	28.3	43,775	29.4
Navy	47,439	23.0	32,658	21.9
Air Force	78,430	38.0	57,701	38.8
Marine Corps	15,997	7.7	10,280	6.9
Coast Guard	6,290	3.0	4,446	3.0
Gender				
Male	184,829	89.5	131,561	88.4
Female	21,762	10.5	17,299	11.6
Race/ethnicity				
Black	43,227	20.9	31,896	21.4
White	138,694	67.1	98,577	66.2
Other	24,670	11.9	18,387	12.4
Rank				
Officer/warrant officer	53,208	25.8	40,444	27.2
Enlisted	153,383	74.2	108,416	72.8
Military occupation				
Infantry/artillery/combat eng	16,843	8.2	11,930	8.0
Armor/motor transport	6,078	2.9	4,252	2.9
Pilot/air crew/air traffic	10,754	5.2	7,571	5.1
Repair/engineer	59,787	28.9	41,843	28.1
Communications/intel	63,140	30.6	45,805	30.8
Healthcare	17,800	8.6	13,713	9.2
All others/not specified	32,189	15.6	23,746	16.0

[a] Service members who had been hospitalized or deployed during the last six months of service were excluded.
[b] An outpatient diagnosis (at the 3-digit level of the ICD-9-CM) that was not present in an individual's electronic medical record in the period between January 1998 and six months before their retirement.

Table 2. Among the most frequent illnesses/injuries diagnosed among retirees (more than 10,000 retirees diagnosed during the surveillance period), percentages diagnosed for the "first time" within six months before retirement, active component, 2003-2009

ICD-9-CM code (3-digit level)	Major diagnostic category	Diagnosis	No. of retirees diagnosed during the 6 months before retirement	% diagnosed for the "first time" during the 6 months before retirement
388	Nervous system	Other disorders of ear	13,376	72.8
327	Nervous system	Organic sleep disorders	14,041	65.8
389	Nervous system	Hearing loss	19,471	59.7
715	Musculoskeletal system	Osteoarthrosis and allied disorders	14,980	48.1
786	Ill-defined conditions	Respiratory and other chest symptoms	22,902	43.2
728	Musculoskeletal system	Disorders of muscle ligament and fascia	12,800	41.8
780	Ill-defined conditions	General symptoms	31,945	40.7
530	Digestive system	Diseases of esophagus	16,701	40.2
723	Musculoskeletal system	Other disorders of cervical region	12,619	39.6
729	Musculoskeletal system	Other disorders of soft tissues	17,407	36.9
722	Musculoskeletal system	Intervertebral disc disorders	15,337	36.1
272	Endocrine, nutrition, immunity	Disorders of lipoid metabolism	37,481	33.1
726	Musculoskeletal system	Peripheral enthesopathies and allied syndromes	22,392	32.4
477	Respiratory system	Allergic rhinitis	15,038	29.5
401	Circulatory system	Essential hypertension	33,233	23.0
719	Musculoskeletal system	Other and unspecified disorders of joint	45,757	22.9
724	Musculoskeletal system	Other and unspecified disorders of back	36,112	21.5
367	Nervous system	Disorders of refraction and accommodation	55,173	15.4

duty (and they had not been hospitalized or deployed during their last 6 months of service) **(Table 1)**. Within six months of retirement, "pre-retirees" (median age: 43 years) collectively received 460,195 incident diagnoses of 864 different medical conditions **(data not shown)**. Nearly three-fourths (n=148,860; 72.1%) of all retirees were diagnosed with at least one condition for the first time (since 1998) during the six months before retirement. The proportions of retirees who received at least one "new" diagnosis during the pre-retirement period did not markedly vary in relation to military or demographic characteristics **(Table 1)**.

Proportions of "first time" diagnoses (of the most frequently diagnosed conditions among pre-retirees)

Of the 18 illnesses and injuries most frequently diagnosed during the pre-retirement period (i.e., more than 10,000 affected pre-retirees per condition), "other disorders of the ear" had the highest proportion of first time diagnoses within six months of retirement **(Table 2)**. Among pre-retirees, "tinnitus (75%), "noise-induced hearing loss" (12%) and otalgia (earache) (6%) were included in the non-specific diagnosis, "other disorders of the ear". Of 13,376 retirees who were diagnosed with "other disorders of the ear" during their last six months of service, nearly three-fourths (72.8%) had no previous record (since 1998) of such disorders. Of the other most frequently diagnosed conditions among pre-retirees, "organic sleep disorders" (65.8%) and "hearing loss" (59.7%) had the next highest proportions of first time diagnoses within six months of retirement **(Table 2)**.

Musculoskeletal conditions accounted for 8 of the 18 most frequently diagnosed conditions during the pre-retirement period **(Table 2)**. Nearly one-half (48.1%) of service members diagnosed with "osteoarthritis and allied disorders" within six months of retirement had no previous diagnosis of the

condition in their electronic medical records. More than one-third of retirees with pre-retirement diagnoses of "disorders of muscle ligament and fascia" (primarily plantar fibromatosis) (41.8%), "other disorders of the cervical region" (primarily "pain in neck") (39.6%), "other disorders of soft tissues" (primarily "pain in limb") (36.9%) and "intervertebral disc disorders" (primarily disc degeneration) (36.1%) had no prior diagnoses of these conditions. Among retirees who were diagnosed with non-specific back or knee problems ("other and unspecified disorders" of the back or the knee) within six months of retirement, more than one-fifth had no prior diagnosis of the condition **(Table 2)**.

Of pre-retirees diagnosed with the ill-defined conditions "general symptoms" (e.g., "malaise and fatigue") or "respiratory and other chest symptoms", more than 40 percent received the diagnosis for the first time within six months of retirement. Of note, fewer than 30 percent of all pre-retirees who were diagnosed with "allergic rhinitis" or high blood pressure received the diagnosis for the first time just prior to retirement **(Table 2)**.

The likelihood that one of the most frequently diagnosed conditions among pre-retirees was diagnosed for the first time during the pre-retirement period varied by occupational group **(Figure 1)**. For example, for 9 of the 18 most frequently diagnosed conditions during the pre-retirement period, affected pre-retirees in aviation-related occupations (e.g., pilots, air crews, air traffic controllers), compared to those in three other military occupational groups, were the most likely to be diagnosed with the conditions for the first time (since January 1998) during their last six months of service. Among pre-retirees in aviation-related occupations who were diagnosed with "organic sleep disorders", three-quarters (74.5%) had no prior diagnosis of the condition in their outpatient records (since 1998); in contrast, among pre-retirees in combat, communications, and health care

Figure 1. Among the most frequent illnesses/injuries (ICD-9-CM) diagnosed among retirees, percentages diagnosed for the "first time" within six months before retirement, by selected occupational groups, 2003-2009
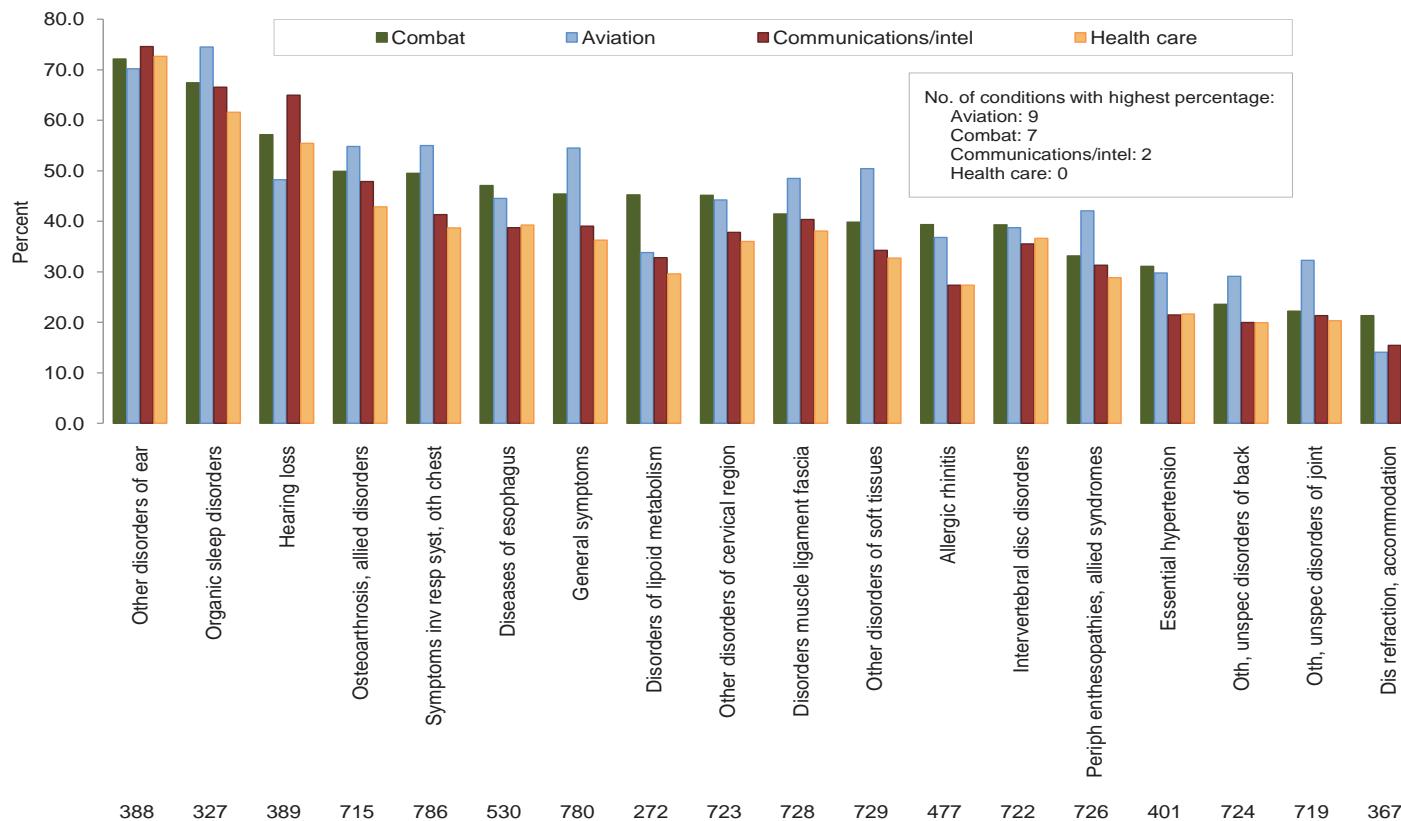
occupations who received organic sleep disorder diagnoses, approximately two-thirds (62-67%) had no prior diagnosis of the condition in their records **(Figure 1)**.

For 7 of the 18 most frequently diagnosed conditions during the pre-retirement period, affected pre-retirees in combat-specific occupations were the most likely to be diagnosed with the conditions for the first time within six months of retirement. "Disorders of lipid metabolism", "disorders of refraction accommodation" and "allergic rhinitis" were more likely to be diagnosed for the first time among pre-retirees in combat-specific occupations than in other selected occupations **(Figure 1)**. Among pre-retirees diagnosed with "hearing loss" or "other disorders of the ear", those in communications/intelligence-related occupations were the most likely to be diagnosed with the conditions for the first time within six months of retirement **(Table 1)**. Of note, pre-retirees in health care occupations were relatively least likely to receive new diagnoses (of 14 of the 18 most frequently diagnosed conditions among pre-retirees) within six months of retirement **(Figure 1)**.

*Numbers and proportions of "first time" diagnoses, by occupation and rank*

Of all conditions diagnosed among pre-retirees, the numbers and proportions that were diagnosed for the first

time within six months of retirement varied by military occupation and rank. For example, during the pre-retirement period, in general, there were fewer illness and injury-specific diagnoses among pre-retirees in aviation-related than selected other military occupational groups (mean diagnoses per person: aviation: 4.07; combat: 4.37; communications/intel: 4.82; healthcare: 5.50) **(Figure 2)**. However, of all conditions diagnosed during the pre-retirement period, the highest proportion of "first time" diagnoses were among pre-retirees in aviation-related occupations (52.4%) **(Figure 2)**. During the pre-retirement period, pre-retirees in health care, compared to selected other occupations, had the most illness and injury-specific diagnoses, as well as the most conditions diagnosed for the first time, per person. However, the proportion of all diagnoses among pre-retirees that were first time diagnoses was lower among those in health care (45.2%) than selected other military occupational groups **(Figure 2)**.

Finally, during the pre-retirement period, in general, there were more illness and injury-specific diagnoses among officers (5.06 per person) than enlisted members (4.52 per person). Also, on average, there were more first time diagnoses among officer (2.56 per person) than enlisted (2.39 per person) pre-retirees; and the proportion of all diagnoses that were first time diagnoses among pre-retirees was slightly higher among officers (49.4%) than enlisted members (47.1%) **(Figure 3)**.

Figure 2. Number of illnesses/injuries (3-digit ICD-9-CM) per person during the six months before retirement, by ever/never prior diagnosis of the condition, in selected occupational groups, 2003-2009
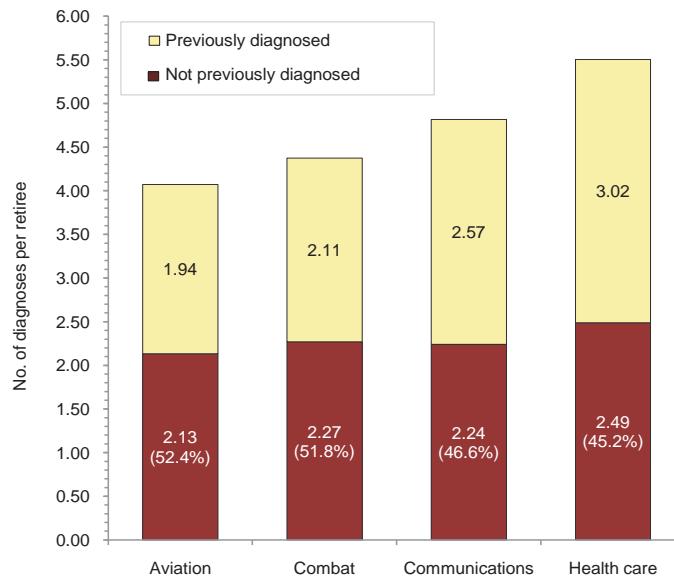

Figure 3. Number of illnesses/injuries (3-digit ICD-9-CM) per person during the six months before retirement, by ever/never prior diagnosis of the condition, by rank, 2003-2009
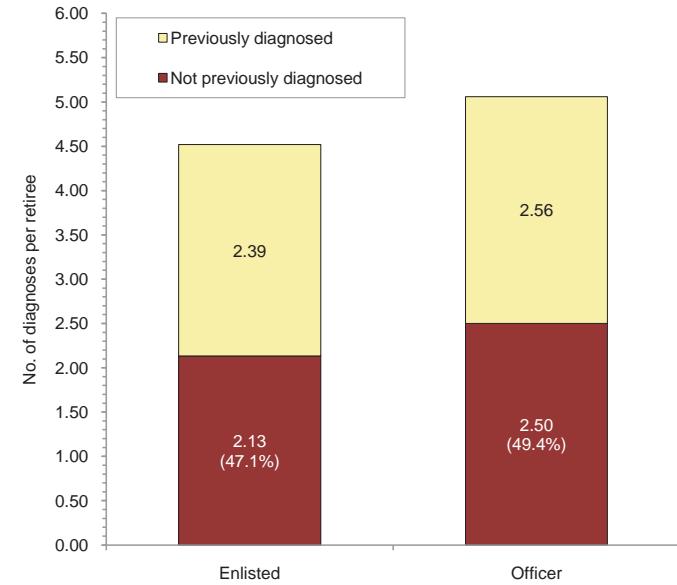
Editorial comment:

This report documents that among the most common illnesses and injuries diagnosed prior to longevity retirements of active military members, tinnitus, hearing loss and sleep disorders had the highest proportions of first time diagnoses within six months of retirement. Of service members diagnosed with these conditions just before retirement, the majority had not received these diagnoses during the previous 5 to 11 years. In general, service members retiring from aviation-related occupations were more likely than other service members to be diagnosed with a first time illness or injury just prior to retirement.

The results of this report should be interpreted in light of several limitations. Medical conditions in this analysis were defined by 3-digit ICD-9-CM codes. Follow-up treatment could appear to be a first time diagnosis if the same condition was diagnosed using different 3-digit codes. Service members with first time diagnoses of certain conditions may have been treated for those conditions prior to January 1998 (when complete electronic medical records became available for health surveillance purposes) or have sought treatment that was not reimbursed by TRICARE.

In 1973, Congress instituted the "presumption of fitness rule" to disallow disability retirements for high-ranking officers (0-7 or higher), Medical Corps officers, and Air Force medical officers who applied for retirement based on length of service or age. The rule addressed concerns regarding officers who were granted disability retirements after 20 or more years of active service; in one highly publicized case, an Air Force General officer retired with a 70 percent disability rating and weeks later passed a Federal Aviation Administration flight physical.

The present analysis suggests that officers (of all occupations) and service members in avaiation-related occupations have previously undiagnosed conditions documented just prior to retirement only slightly more often than their counterparts. Pilots, air crew and air traffic controllers receive routine periodic medical examinations. Diagnoses of certain conditions during such examinations may result in suspensions of their usual duties (and flight pay) and increased scrutiny during subsequent examinations. Thus, there are strong incentives for service members in these occupations not to disclose certain health complaints.

This report and its companion[1] suggest that in general, service members within a few months of retirement have higher rates of recorded diagnoses of illnesses and injuries than service members who are not retiring. Regardless of the reasons (e.g., reporting incentives/disincentives, thorough screening during retirement physical exams), first time diagnoses among retirees may not be accurate indicators of incident medical events. This should be considered when designing, conducting, and interpreting results of health surveillance analyses. For example, when estimating incidence rates of illnesses and injuries among U.S. military members, it may be appropriate to exclude the last six months of service of retirees who served 20 or more years.

References:

1. Armed Forces Health Surveillance Center. Illness and injury diagnoses within six months before retirement after 20 or more years of active service, active component, U.S. Armed Forces, 2000-2009. *Medical Surveillance Monthly Report (MSMR)*. 2010 Oct; 17(10):2-6.

Osteoarthritis and Spondylosis, Active Component, U.S. Armed Forces, 2000-2009

Arthritis is a major and growing public health concern in the United States; the CDC recently reported that an estimated 22.2 percent of U.S. adults have been diagnosed with arthritis by a physician.[1] Osteoarthritis (OA), the most common form of arthritis, is a non-inflammatory degenerative joint disease characterized by destruction of cartilage and remodeling of bone at the joints. "Spondylosis" is osteoarthritis of the spine.

OA and spondylosis are common in the general U.S. population and associated with aging; they have diverse clinical manifestations including pain, stiffness, immobility, and dysfunction. Risk factors for OA/spondylosis include obesity, family history, joint hypermobility, and anatomic deformities.[2,3] Severe traumatic and repetitive minor injuries (e.g., during occupational or recreational activities) also increase risk of OA/spondylosis.[2,4] U.S. military members have significant risk for OA/spondylosis. Military training and operational activities are often physically demanding and sometimes traumatic (e.g., heavy load bearing; hand-to-hand combat training). Musculoskeletal disorders (including OA) have been associated with specific occupations, and some military occupations are inherently stressful to bones and joints (e.g., pilots and crews of fixed- and rotary-wing aircraft; drivers and crews of military vehicles; paratroopers).[5-8] Overall and in the military, work-related injuries account for significant lost work time, health care costs, and disability compensation.[7]

This report summarizes the numbers, rates, trends, and demographic and occupational characteristics of active component members of the U.S. Armed Forces who were diagnosed with osteoarthritis or spondylosis during the past ten years.

Methods:

The surveillance period was 1 January 2000 to 31 December 2009. The surveillance population included all individuals who served in the active component of the U.S. Armed Forces during the surveillance period. For surveillance purposes an incident case of osteoarthritis or spondylosis was defined by a record of a hospitalization or records of two outpatient encounters within two years that included a diagnosis of "osteoarthritis" (ICD-9-CM: 715.XX) or "spondylosis" (ICD-9-CM: 721.XX) in any diagnostic position. Each individual could be considered an incident case of osteoarthritis and spondylosis only once each during the surveillance period.

The anatomical locations of osteoarthritis were summarized based on the fifth digit of osteoarthritis-specific diagnosis codes; if individuals received more than one osteoarthritis indicator diagnosis, specific anatomical locations (e.g., shoulder, lower leg) were prioritized over nonspecific locations (i.e., unspecified, unknown, multiple). All data used for analyses were derived from the Defense Medical Surveillance System (DMSS).

Results:

During the 10-year surveillance period there were 68,449 incident diagnoses of osteoarthritis and 43,254 incident diagnoses of spondylosis **(Table 1)**. The incidence rate of osteoarthritis increased by 65 percent from 2001 (356 per 100,000 p-yrs) to 2006 (589 per 100,000 p-yrs) and then remained relatively steady to 2009 (582 per 100,000 p-yrs). The rate of spondylosis quadrupled during the period (2000: 128 per 100,000 p-yrs; 2009: 522 per 100,000 p-yrs); the largest annual increases during the period were in 2006 (rate difference (RD), 2006-2005: +63 per 100,000 p-yrs) and 2007 (RD, 2007-2006: +97 per 100,000 p-yrs) **(Figure 1)**.

Table 1. Incidence counts and rates of osteoarthritis and spondylosis, active component, U.S. Armed Forces, 2000-2009

	Osteoarthritis		Spondylosis	
	No.	Rate[a]	No.	Rate[a]
Total	68,449	489	43,254	307
Age				
<20	538	41	328	25
20-24	5,418	115	4,570	97
25-29	7,396	254	6,019	206
30-34	9,218	460	6,655	329
35-39	17,514	1,004	10,905	614
40+	28,365	2,191	14,777	1,091
Service				
Army	29,604	607	19,901	403
Navy	13,878	396	7,446	211
Air Force	17,987	525	11,200	324
Marine Corps	5,057	282	3,575	199
Coast Guard	1,923	487	1,132	295
Sex				
Male	58,560	490	36,300	301
Female	9,889	487	6,954	340
Race ethnicity				
White, non-Hispanic	41,623	470	29,614	332
Black, non-Hispanic	17,185	696	7,047	281
Hispanic	4,857	347	3,358	239
American Indian/Alaskan Native	943	416	656	287
Asian/Pacific Islander	2,062	328	1,388	220
Other	1,779	437	1,191	290

[a]Rate per 100,000 person-years

Figure 1. Incidence rates of osteoarthritis and spondylosis, active component, U.S. Armed Forces, 2000-2009
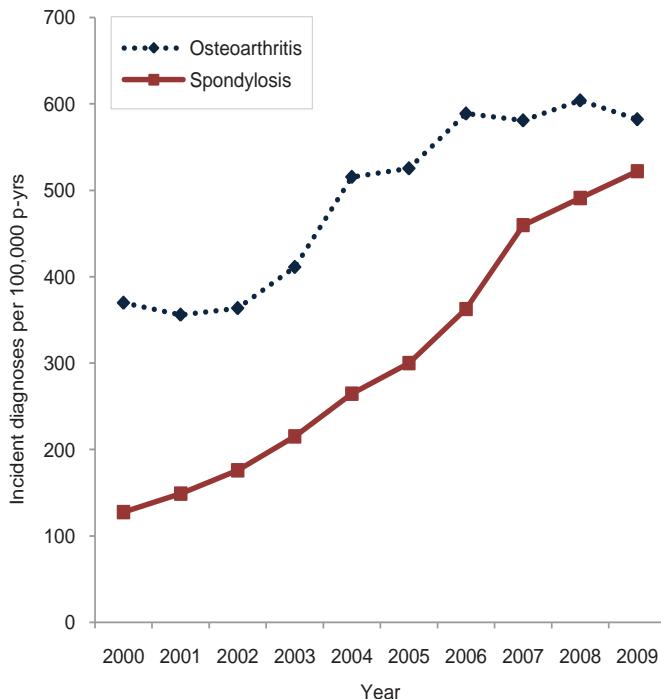
Age

For both osteoarthritis and spondylosis, incidence rates increased steadily with increasing age, particularly in age groups older than 34 years. The incidence rate of osteoarthritis among those 40 and older was nearly five times the rate among those 30-34 years old; and the rate of spondylosis among those 40 and older was more than three times the rate among those 30-34 years old **(Table 1).**

Service

Among the Services, crude overall rates of osteoarthritis and spondylosis were highest in the Army and lowest in the Marine Corps **(Table 1).** In every age group, rates of osteoarthritis were higher in the Army than any other Service. In the other Services, rates of osteoarthritis were slightly higher among Marines than Navy or Coast Guard members and similar among Marines and Air Force members **(Figure 2a).**

Similarly, in every age group, rates of spondylosis were higher in the Army than in any other Service. In the other Services, in age groups of 30 years and older, rates of spondylosis were higher in the Marine Corps than in the Air Force, Coast Guard, or Navy **(Figure 2b).**

Gender

Crude overall rates of osteoarthritis were similar among males and females. The crude rate of spondylosis was slightly higher among females (340 per 100,000 p-yrs) than males (301 per 100,000 p-yrs) **(Table 1).** In each age group younger than 40 years, rates of osteoarthritis were similar among

females and males; however, among those 40 and older, the rate was 26 percent higher among females **(data not shown).** Regarding spondylosis, in all age groups, rates were higher among females than males; and among those 40 and older, the rate was 34 percent higher among females **(data not shown).**

Race/ethnicity

The overall crude rate of osteoarthritis was much higher among black non-Hispanic than all other race/ethnicity-

Figure 2a. Incidence rates of osteoarthritis by service and age, active component, U.S. Armed Forces, 2000-2009
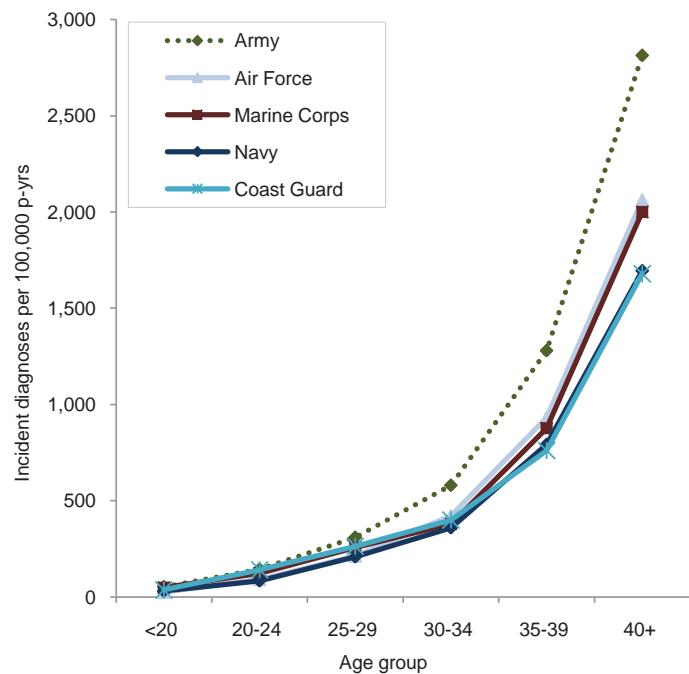
Figure 2b. Incidence rates of spondylosis by service and age, active component, U.S. Armed Forces, 2000-2009
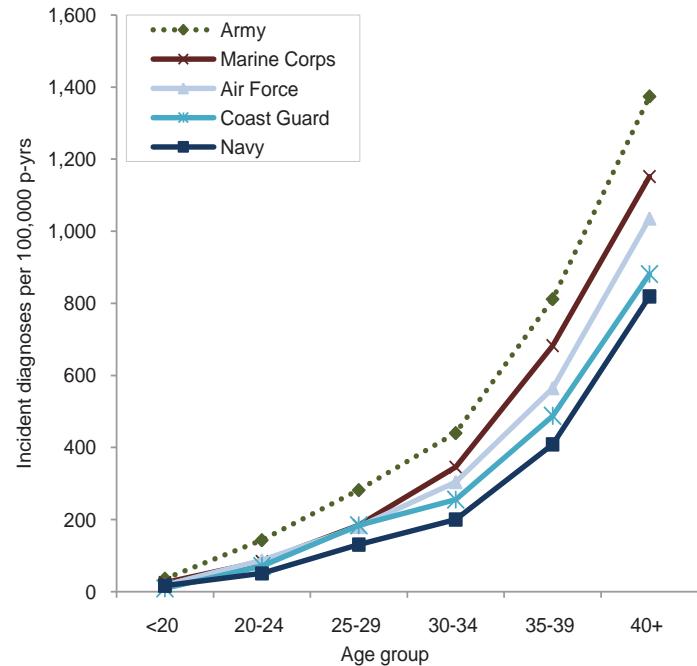
defined groups of service members. Overall crude rates of spondylosis were moderately higher in white non-Hispanics compared to all other race/ethnicity-defined groups **(Table 1)**. This difference was variable by year over the surveillance period, thus no clear trend was apparent **(data not shown)**.

In every age group of 25 years and older, the rate of osteoarthritis was higher among black non-Hispanics than other racial/ethnic group members; among those 40 years and older, the rate was 57 percent higher among black non-Hispanic than white non-Hispanic service members. Of note, in each age group of 30 years and older, the rates of osteoarthritis among American Indian/Alaskan Native and black non-Hispanic service members were nearly identical **(Figure 3)**.

Anatomical site

There were more than twice as many incident diagnoses of osteoarthritis of the lower leg (knee joint) (183.5 per 100,000 p-yrs) as any other anatomical site **(data not shown)**. Crude rates of incident diagnoses of osteoarthritis of the knee and ankle/foot were similar among males and females; however, rates of diagnoses of OA of the upper arm (elbow) and shoulder among males were 3.4- and 2.2-times, respectively, the corresponding rates among females. The rates of diagnoses of OA of the hand and pelvis was approximately 50 percent higher among females than males and rates of osteoarthritis of other, unspecified, and multiple anatomic sites were 24-50 percent higher among females than males **(Figure 4)**. Unadjusted rates of osteoarthritis of all anatomic locations except the shoulder were higher among black, non-Hispanic service members than others; of note, the rate of osteoarthritis of the lower leg (knee joint) among black, non-Hispanic service members was nearly twice the rate among white, non-Hispanic service members **(Figure 5)**.

The increase in rates of spondylosis overall during the 10-year period was almost entirely (over 92%) attributable to large increases in the rates of lumbar and cervical spondylosis; rates of spondylosis of other sites were relatively low and stable throughout the period **(Figure 6)**.

Occupation

Crude overall rates of osteoarthritis were higher among service members in health care (665 per 100,000 p-yrs) and communications/intel (574 per 100,000 p-yrs) than other occupational groups (data not shown). However, when stratified by age, rates of osteoarthritis in service members 30 years and older were highest in armor/motor transport and lowest in aviation-related (e.g., pilots, aircrews) occupational groups **(Figure 7)**.

Crude rates of spondylosis were higher among health care workers (414 per 100,000 p-yrs) and rotary wing pilots (402 per 100,000 p-yrs) than members of other occupational groups **(data not shown)**. However, when stratified by age, rates of spondylosis in service members 25 years and older,

Figure 3. Incidence rates of osteoarthritis by race/ethnicity and age, active component, U.S. Armed Forces, 2000-2009
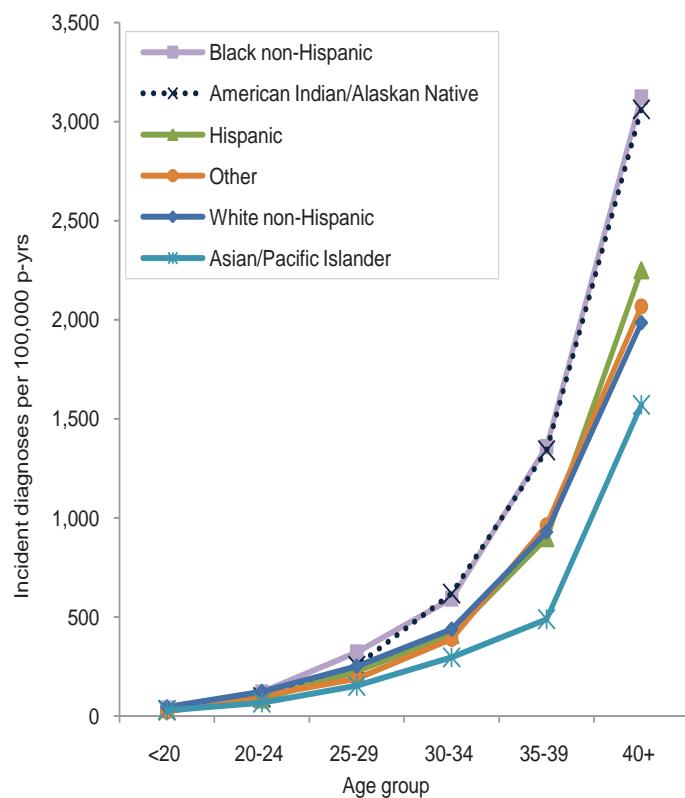
Figure 4. Incidence rates of osteoarthritis by gender and anatomical site, active component, U.S. Armed Forces, 2000-2009
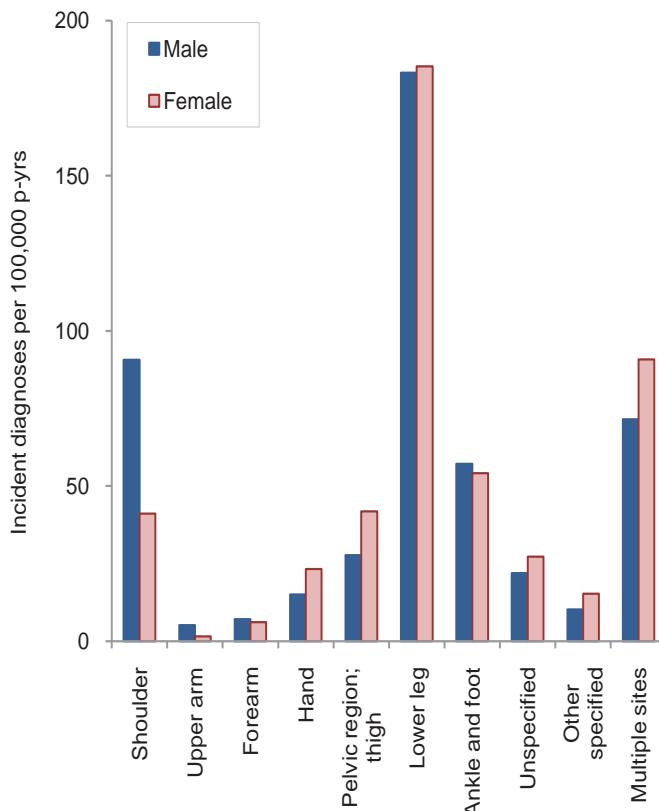
Figure 5. Incidence rates of osteoarthritis by race/ethnicity and anatomical site, active component, U.S. Armed Forces, 2000-2009
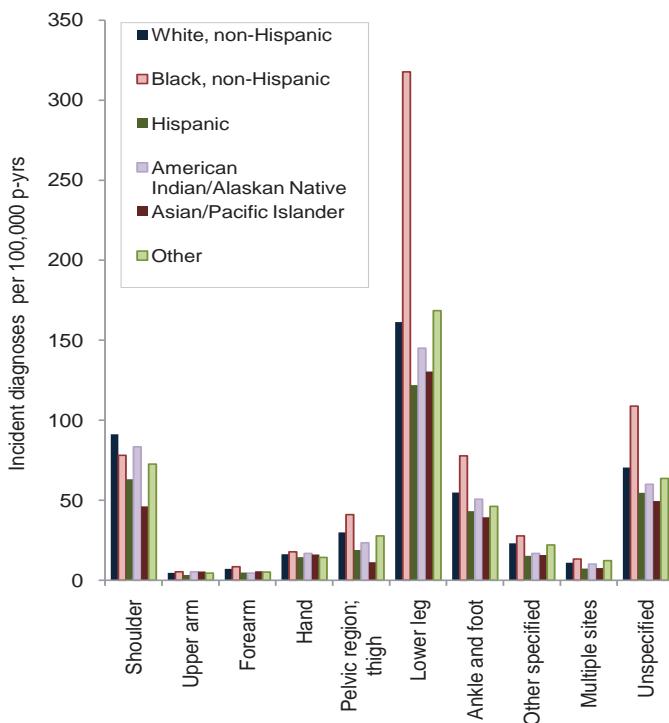
Figure 6. Incidence rates of spondylosis by anatomical site, active component, U.S. Armed Forces, 2000-2009
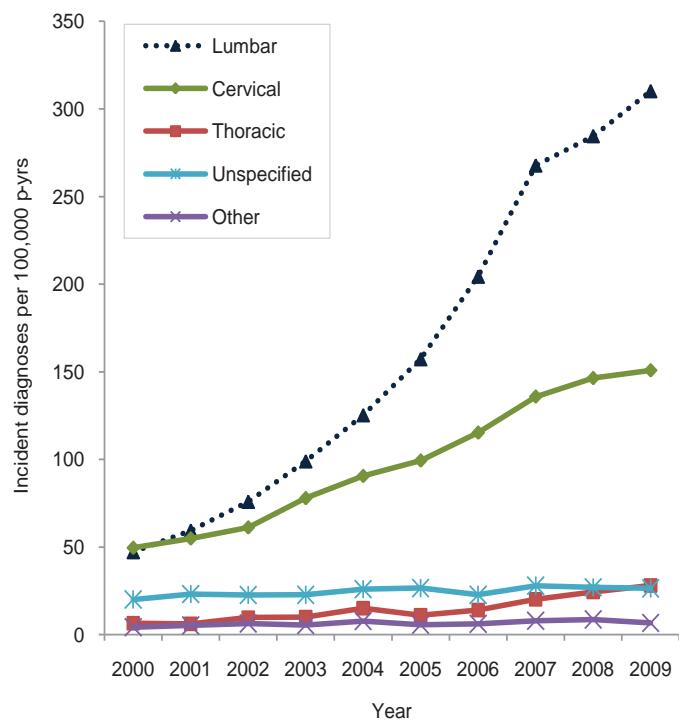
were highest among those in armor/motor transport and combat-specific (e.g., infantry, artillery, combat engineering) occupations **(Figure 8)**. In all age groups, rates of spondylosis were lowest among rotary and fixed wing pilots and other aircrew members **(Figure 8)**.

Editorial comment:

In the past decade, incident diagnoses of osteoarthritis and spondylosis have increased in most military and demographic subgroups of active component members. In this analysis, incident diagnoses of spondylosis increased more consistently and by much greater numbers overall than those of osteoarthritis; thus, for example, in 2000, there were almost three times as many incident diagnoses of osteoarthritis as of spondylosis, while in 2009, there were only 11 percent more incident diagnoses of osteoarthritis than spondylosis. The reasons for the much larger increase of spondylosis than osteoarthritis diagnoses since 2000 are not clear.

The results of this analysis reiterate the very strong relationships between clinically significant osteoarthritis and spondylosis and increasing age. Over the age range of U.S. military members, rates of incident diagnoses of osteoarthritis and spondylosis increase exponentially. Thus, for example, rates of osteoarthritis and spondylosis diagnoses were 18- and 10-times higher, respectively, among service members 40 and older compared to those 20-24 years old. The finding emphasizes the importance of accounting for the effects of age when assessing other potential risk factors for osteoarthritis

and spondylosis. For example, the crude (unadjusted) rate of incident diagnoses of osteoarthritis was higher among health care workers than any other occupational group; however, after adjusting for age, the highest rate of incident diagnoses was among members of the armor/motor transport occupational group (e.g., tank crews, truck drivers).

After adjusting for age effects, rates of incident diagnoses of osteoarthritis and spondylosis were generally higher among military members who were in the Army, female, and black non-Hispanic or American Indian/Alaskan Native race/ethnicities compared to their respective counterparts. In all military and demographic subgroups, the lower leg (knee joint) was the anatomic site most frequently affected by osteoarthritis. Absolute and relative rates of diagnoses of osteoarthritis in other joints varied across gender, race/ethnicity, and military occupational subgroups. For example, among men, the anatomic sites most affected by osteoarthritis were the knee, shoulder, and ankle/foot; while among women, the sites most affected were the knee, ankle/foot, shoulder, hand, and pelvis. Differences between men and women of rates and sites of osteoarthritis diagnoses likely reflect anatomic, occupational, and/or physical activity-related risk factors as well as differences in access to and/or propensities to seek care for joint pain at a military medical facility.

Osteoarthritis and obesity are interrelated; each can be a cause and a consequence of the other. As in the U.S. general population, the incidence of overweight/obesity in the U.S. military has increased in the past decade; this increase may have contributed to the increase in osteoarthritis diagnoses

Figure 7. Incidence rates of osteoarthritis by occupation and age, active component, U.S. Armed Forces, 2000-2009
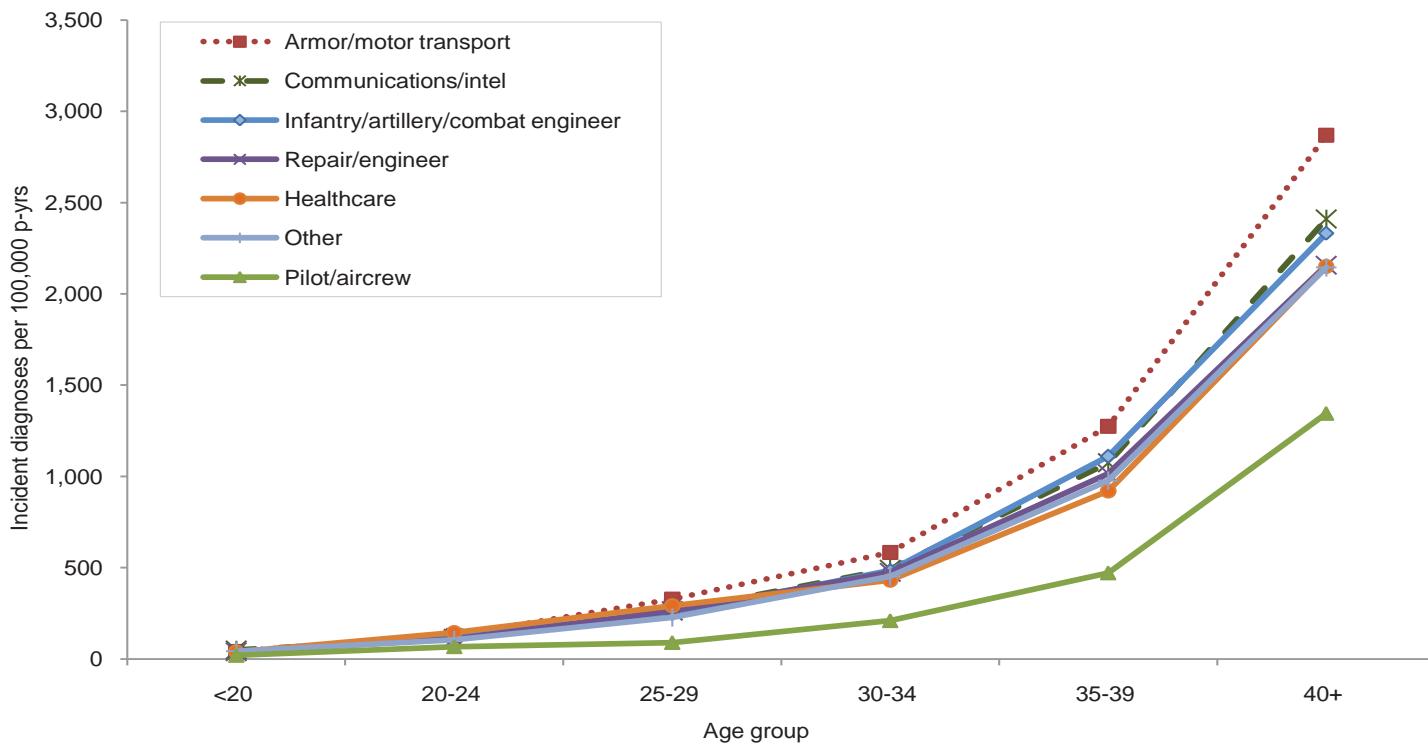
Figure 8. Incidence rates of spondylosis by occupation and age, active component, U.S. Armed Forces, 2000-2009
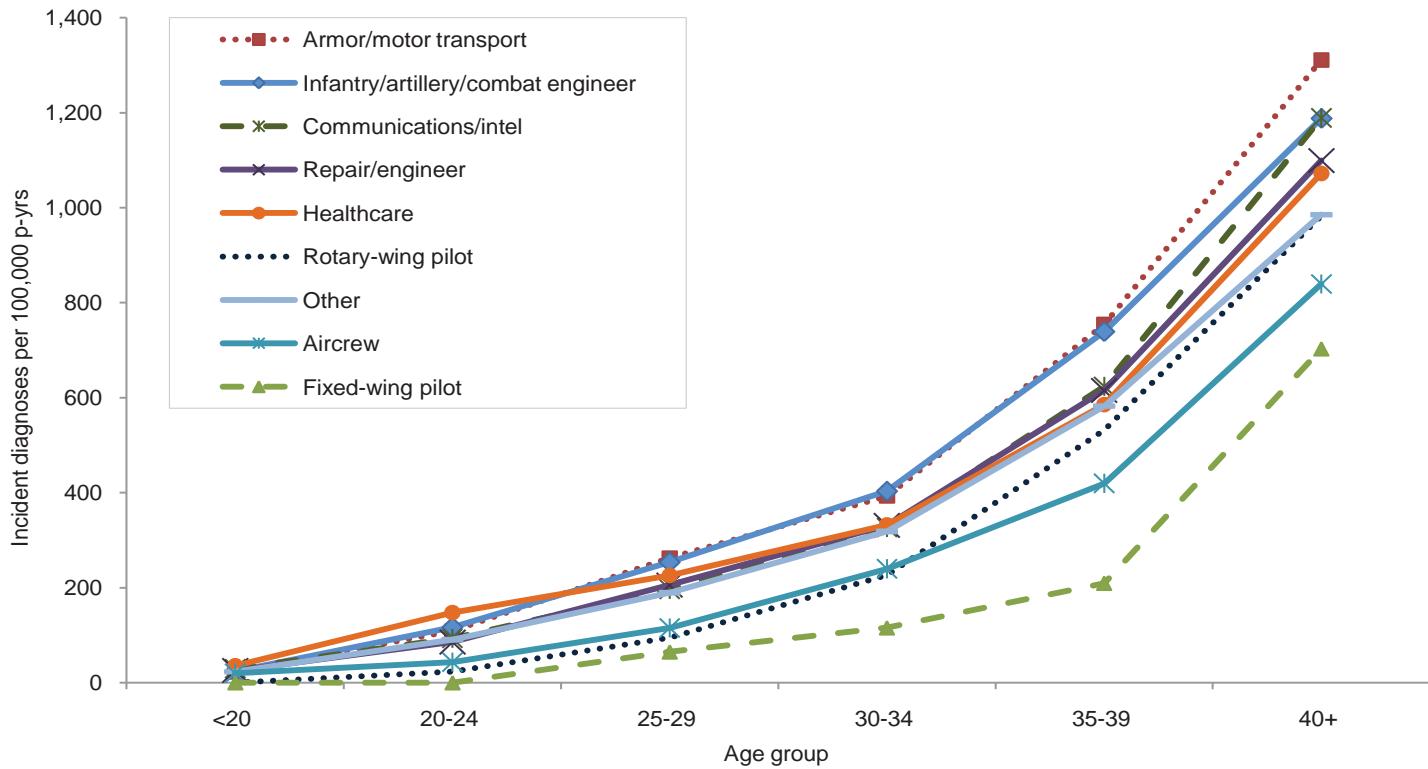
among military members during the same period. In addition, disability from osteoarthritis may limit physical activity which may lead to weight gain. In 2009, the MSMR reported that service members with an overweight/obese diagnosis had rates of joint and back disorders three times higher than service members overall.[9]

In this analysis, pilots and other aircrew members had lower rates of diagnoses of osteoarthritis and spondylosis than any other occupational group. At least one previous study documented a higher rate of x-ray evidence of spondylosis (particularly of the cervical spine) among pilots (particularly rotary-wing) compared to age-matched non-flying controls.[8] The findings of this MSMR report may reflect the propensity of military aviators and crewmen to not seek care for conditions that do not significantly interfere with their military aviation duties.

There are limitations to this analysis that should be considered when interpreting the results. For example, over the long courses of progression of osteoarthritis and spondylosis, the natures and severity of signs and symptoms of the conditions significantly vary; thus, in the earliest clinical stages, diagnoses may be based on symptoms alone, while later in clinical courses, there may be unambiguous objective evidence (e.g., radiographic) of arthritic damage to affected joints. As such, criteria for diagnosing the conditions in active military members may vary across health care providers and clinical settings, as well as in relation to the military duties of those affected. For example, some care providers may diagnose osteoarthritis and spondylosis based on symptoms alone, while others may require radiographic confirmation before reporting specific diagnoses in medical records.

In addition, this report summarizes the experiences of active component members only. In general, reserve component members are older than their active component counterparts. Thus, because rates of clinically relevant osteoarthritis and spondylosis are so strongly associated with age, it is likely that osteoarthritis and spondylosis are more prevalent among reserve than active component members.

Also, this report summarizes diagnoses of osteoarthritis and spondylosis that were reported on standardized records of hospitalizations and outpatient encounters in fixed (e.g., not deployed or at sea) U.S. military and civilian (purchased care) medical facilities. As a result, the numbers and rates of incident diagnoses reported here underestimate the actual numbers and rates of incident diagnoses to the extent that some incident diagnoses were not ascertained as cases for this analysis.

This report summarizes numbers and rates of incident (first time per person) diagnoses of the conditions of interest. As such, the results do not necessarily indicate the prevalences or military-operational impacts of the conditions in the Armed Forces. For example, service members with disabling osteoarthritis or spondylosis may leave active military service earlier than their unaffected counterparts; if so, the continuous attrition from service of those affected would lower the prevalence, military operational impacts, and health care costs associated with the conditions among those who remain. Also, individuals who are unable to perform their occupation-specific duties with osteoarthritis or spondylosis may change occupations; if so, the prevalences of osteoarthritis or spondylosis would be relatively higher in those occupations that retain service members with these conditions.

Finally, this report is a descriptive summary of incidence rates of clinically relevant osteoarthritis and spondylosis among active component members. The report documents increases in rates of diagnoses of the conditions over the past ten years. However, it does not identify modifiable risk factors for the conditions. The findings suggest a need for research to identify military-specific equipment and activities that significantly increase risk of acute and chronic damage to joints (particularly, the knees, shoulder, and back). Findings of such research would be useful to develop, test, and implement practical and effective countermeasures against osteoarthritis and spondylosis among military members in general and those in high risk occupations specifically.

References:

1. Prevalence of doctor-diagnosed arthritis and arthritis-attributable activity limitation--United States, 2007-2009. *MMWR Morb Mortal Wkly Rep*. 2010 Oct 8 2010;59(39):1261-1265.
2. Cooper C, Inskip H, Croft P, et al. Individual risk factors for hip osteoarthritis: Obesity, hip injury and physical activity. *Am J Epidemiol*. 1998;147(6):516-522.
3. Spector TD, MacGregor AJ. Risk factors for osteoarthritis: Genetics. *Osteoarthritis Cartilage*. 2004;12(S1):39-44.
4. Cooper C, Campbell L, Byng P, et al. Occupational activity and the risk of hip osteoarthritis. *Ann Rheum Dis*. 1996;55:680-682.
5. Dominick KL, Golightly YM, Jackson GL. Arthritis prevalence and symptoms among US non-veterans, Veterans, and Veterans receiving Department of Veterans Affairs healthcare. *J Rheumatol*. 2006;33(2):348-354.
6. Rossignol M, Leclerc A, Hilliquin P, et al. Primary osteoarthritis and occupations: A national cross sectional survey of 10,412 symptomatic patients. *Occup Environ Med*. 2003;60:882-886.
7. Feuerstein M, Berkowitz SM, Peck CA. Musculoskeletal-related disability in US Army personnel: prevalence, gender and military occupational specialties. *J Occup Environ Med*. 1997 Jan;39(1):68-78.
8. Aydog ST, Turbedar E, Demirel AH. Cervical and lumbar spinal changes diagnosed in four-view radiographs of 732 military pilots. *Aviat Space Environ Med*. 2004;75:154-157.
9. Armed Forces Health Surveillance Center. Diagnoses of overweight/obesity, active component, U.S. Armed Forces, 1998-2008. *Medical Surveillance Monthly Report (MSMR)*. 2009 Jan;16(1):2-6.

Surveillance Snapshot: Pertussis Diagnoses Among Service Members and Other Beneficiaries of the U.S. Military Health System, January 2008-November 2010[a]

Pertussis ("whooping cough") is a highly infectious respiratory disease that is commonly known as a disease of childhood. It is caused by the bacterium *Bordetella pertussis*. Pertussis is vaccine preventable; yet, thousands of cases and many outbreaks are reported each year in the U.S. Individuals at highest risk are infants, unvaccinated children, and teens and adults with waning immunity.

For this summary, a case was defined as a reportable medical event of pertussis (ICD-9: 033). During the surveillance period, there were 219 reports of pertussis among U.S. military members and other beneficiaries of the U.S. Military Health System. Approximately eighty percent (n=173) of the reported cases affected non-military members ("other beneficiaries"); most of the other cases affected members of the active component (n=41) **(Figure 1)**. Approximately one-half (n=113) of the reported cases affected infants or children (<18 years old) **(data not shown)**. During the surveillance period, seven locations had four or more cases within one month periods ("spatiotemporal clusters") **(Figure 2)**; several of the clusters were associated with outbreaks in adjacent nonmilitary communities.

The recent resurgence of pertussis in the U.S. highlights the importance of primary and booster vaccinations against pertussis among infants, young children, adolescents, and adults.

Figure 1. Monthly diagnoses of pertussis among beneficiaries of the U.S. Military Health System, by status, January 2008-November 2010[a]
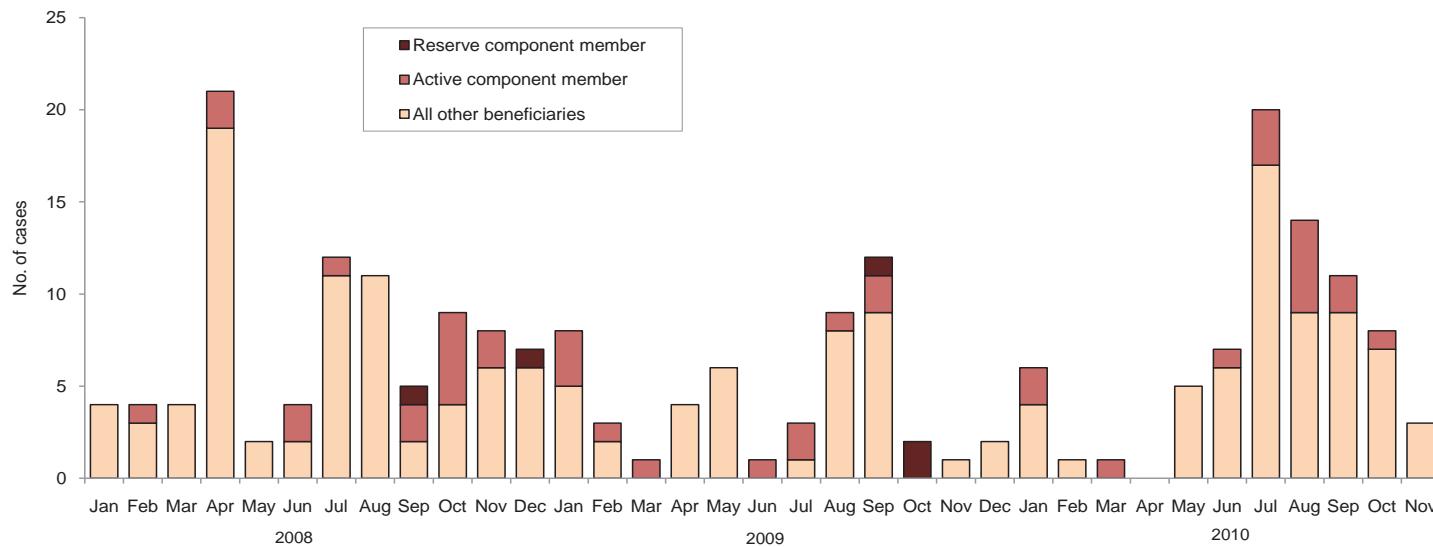
[a]As of November 12, 2010

Figure 2. Installations with four or more pertussis cases during any calender month over time, January 2008-November 2010[a]
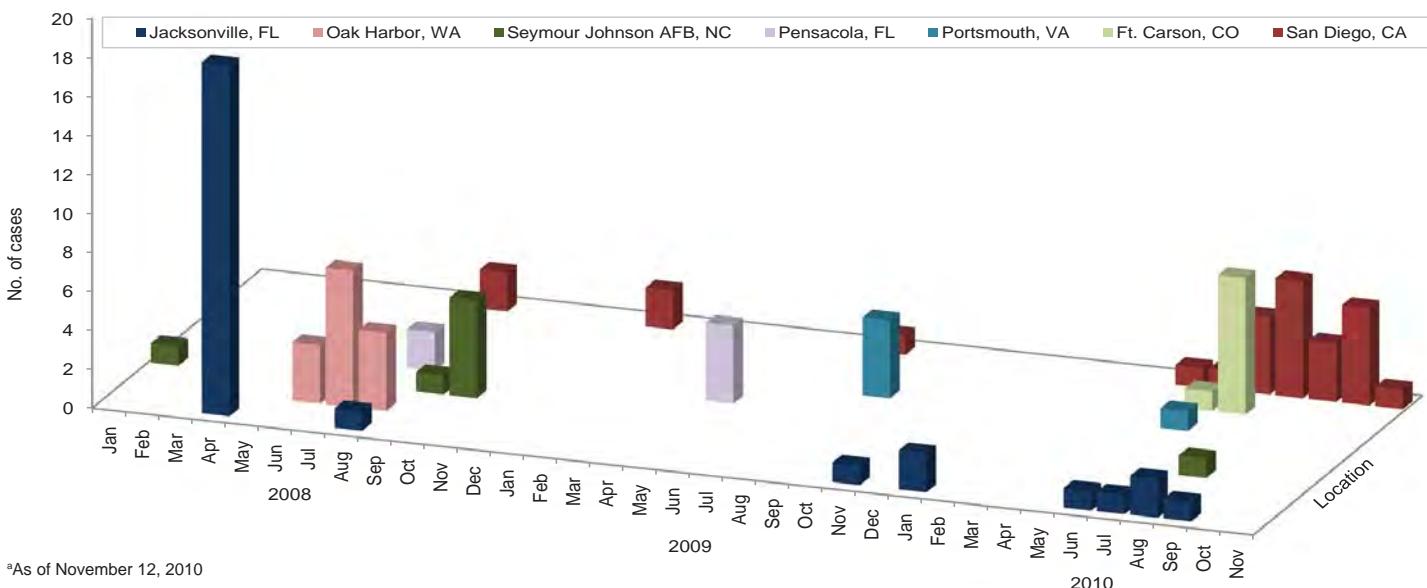
[a]As of November 12, 2010

Surveillance Snapshot:
Coccidioidomycosis Diagnoses by Location, Active Component, 2000-2009

Coccidioidomycosis is an infectious illness caused by *Coccidioides immitis* (*C. immitis*), a naturally occurring fungus found in the soil of large areas of the southwestern United States and Central and South America. In most healthy human hosts, the infection is asymptomatic or the symptoms are mild; however, it can produce clinically significant lower respiratory illness. Most coccidioidomycosis infections are self-limited; however, in rare cases, the infection spreads beyond the respiratory tract and may involve the skin, bones and joints, or the central nervous system (meningitis). The risk of such spread is especially high in persons with compromised immune systems due to underlying disease or therapies that suppress immune function.

Coccidioidomycosis is an occupational hazard for U.S. military members who are assigned or train in endemic areas. Because of its non-specific clinical manifestations and delayed onset of symptoms, affected military members may present for care outside of endemic areas; in such cases, correct diagnoses and indicated treatments may be delayed.[1]

For this summary, a case was defined by one notifiable medical event or one hospitalization record or by two records of outpatient encounters within 14 days that included the diagnosis code ICD-9-CM: 114.X ("coccidioidomycosis").

From 2000 to 2009, there were 363 incident cases of coccidioidomycosis among active duty service members. Of cases with identifiable diagnostic locations, more than three-fourths (78%) were diagnosed in the three endemic states of the U.S.: California (n=182), Arizona (n=64), and Texas (n=23). The others (22%) were diagnosed outside the endemic region (including 13 cases [4%] that were diagnosed outside the United States) **(Figure 1)**.

Providers of health care to U.S. military members should consider coccidioidomycosis a potential cause of febrile respiratory infectious illnesses among those currently or previously exposed to endemic areas.

1. Crum-Cianflone N. Coccidioidomycosis in the U.S. military: A review. Ann NY Acad Sci. 2007;1111:112-121.

Figure 1. Number of coccidiodidomycosis diagnoses by state, active component, 2000-2009
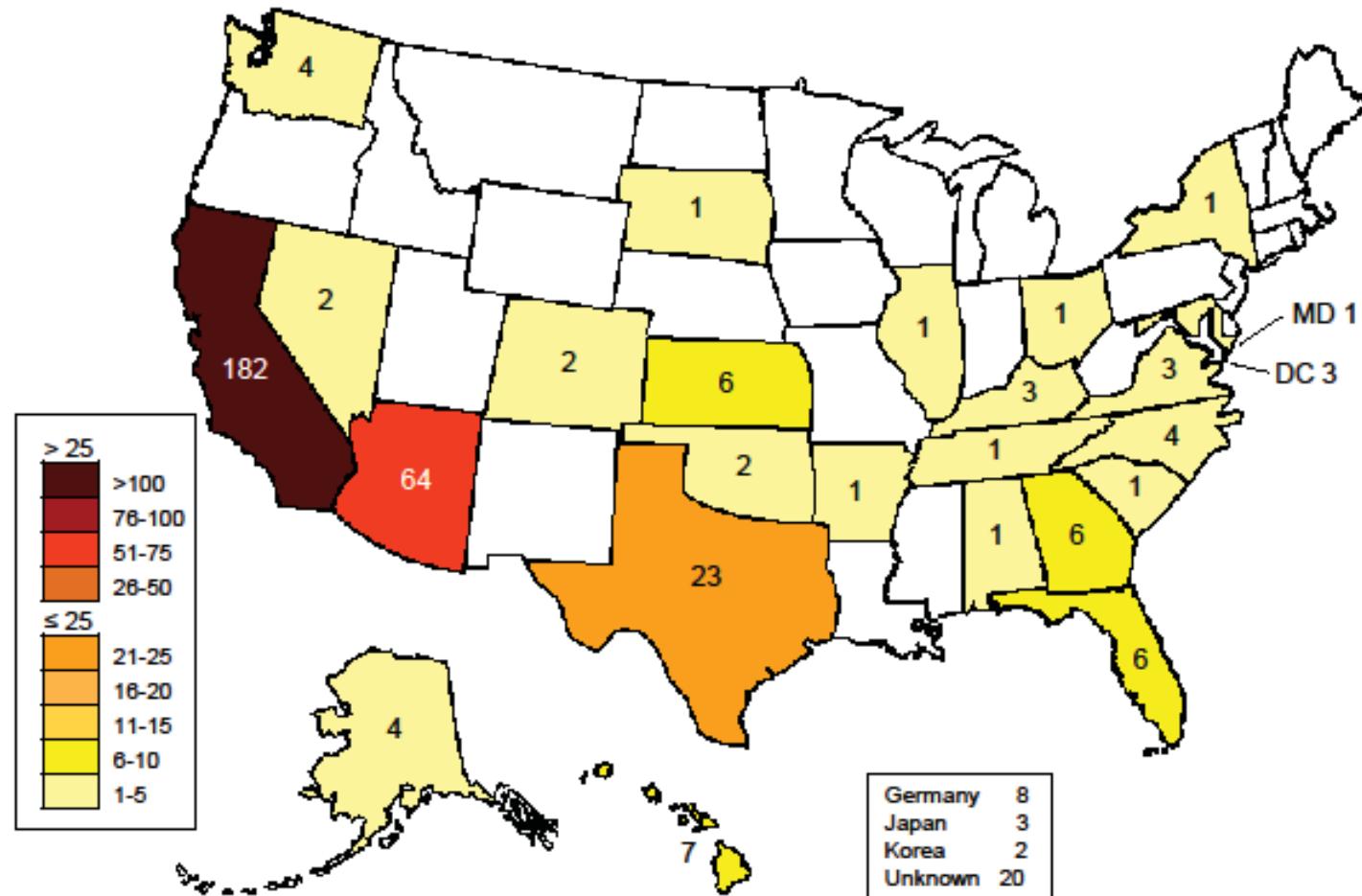
Update: Deployment Health Assessments, U.S. Armed Forces, December 2010

Since January 2003, peaks and troughs in the numbers of pre- and post-deployment health assessment forms transmitted to the Armed Forces Health Surveillance Center generally corresponded to times of departure and return of large numbers of deployers. Between April 2006 and November 2010, the number of post-deployment reassessment (PDHRA) forms per month ranged from 15,600 to 46,900 **(Table 1, Figure 1)**.

During the past 12 months, the proportions of returned deployers who rated their health as "fair" or "poor" were 8-11% on post-deployment health assessment questionnaires and 10-14% on PDHRA questionnaires **(Figure 2)**.

In general, on post-deployment assessments and reassessments, deployers in the Army and in reserve components were more likely than their respective counterparts to report health and exposure-related concerns **(Table 2, Figure 3)**. Both active and reserve component members were more likely to report exposure concerns three to six months after, compared to the time of return from deployment **(Figure 3)**.

At the time of return from deployment, soldiers serving in the active component were the most likely of all deployers to receive mental health referrals; however, three to six months after returning, active component soldiers were less likely than Army Reservists to receive mental health referrals **(Table 2)**.

Finally, during the past three years, reserve component members have been more likely than active component service members to report "exposure concerns" on postdeployment assessments and reassessments **(Figure 3)**.

Table 1. Deployment-related health assessment forms, by month, U.S. Armed Forces, December 2009-November 2010

	Pre-deployment assessment DD2795		Post-deployment assessment DD2796		Post-deployment reassessment DD2900	
	No.	%	No.	%	No.	%
Total	**403,057**	**100**	**422,373**	**100**	**327,329**	**100**
2009						
December	31,077	7.7	36,590	8.7	29,160	8.9
2010						
January	55,692	13.8	34,260	8.1	25,842	7.9
February	31,502	7.8	27,787	6.6	27,105	8.3
March	32,675	8.1	44,816	10.6	35,929	11.0
April	32,300	8.0	33,606	8.0	24,943	7.6
May	38,390	9.5	35,445	8.4	22,794	7.0
June	31,107	7.7	45,373	10.7	24,711	7.5
July	30,398	7.5	46,875	11.1	22,998	7.0
August	38,100	9.5	37,349	8.8	31,491	9.6
September	33,056	8.2	27,685	6.6	27,863	8.5
October	27,110	6.7	27,092	6.4	26,457	8.1
November	21,650	5.4	25,495	6.0	28,036	8.6

Figure 2. Proportion of deployment health assessment forms with self-assessed health status as "fair" or "poor", U.S. Armed Forces, December 2009-November 2010
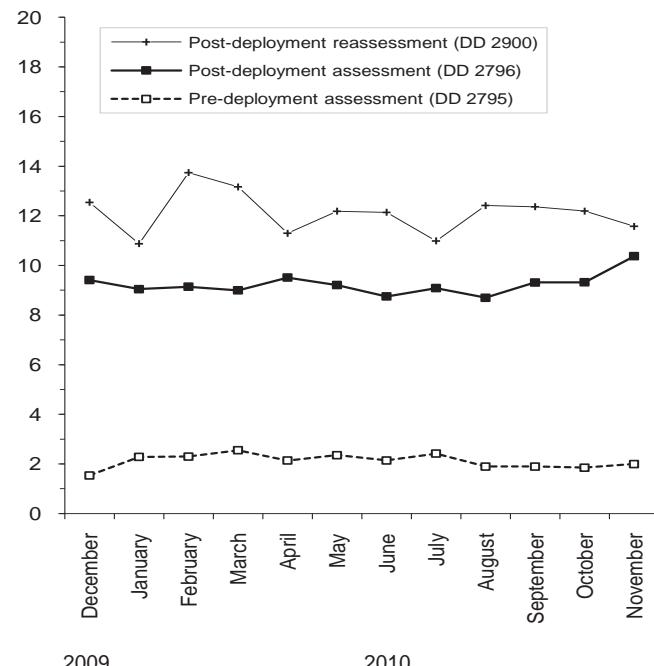
Figure 1. Total deployment health assessment and reassessment forms, by month, U.S. Armed Forces, January 2003-November 2010
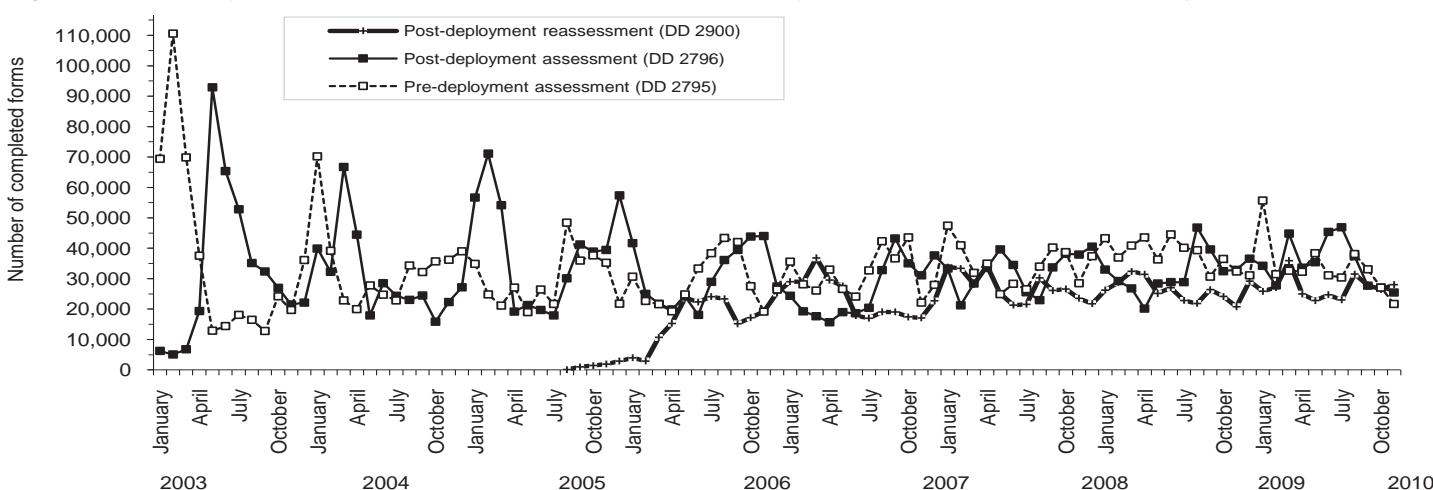
Table 2. Percentage of service members who endorsed selected questions/received referrals on health assessment forms, U.S. Armed Forces, December 2009-November 2010

| Active component	Army			Navy			Air Force			Marine Corps			All service members		
	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900
	n=141,601	n=141,381	n=128,023	n=18,095	n=15,806	n=13,958	n=59,471	n=54,139	n=51,519	n=31,916	n=29,351	n=30,815	n=251,083	n=240,677	n=224,315
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
General health "fair" or "poor"	3.6	9.8	14.4	1.2	4.6	5.9	0.4	3.2	4.2	1.5	7.7	10.4	2.4	7.7	11.0
Health concerns, not wound or injury	13.6	26.5	25.8	3.1	12.1	15.1	1.3	5.5	10.8	2.4	12.1	18.7	8.5	19.1	20.7
Health worse now than before deployed	na	21.5	24.3	na	11.9	13.7	na	8.2	8.6	na	17.2	20.0	na	17.4	19.4
Exposure concerns	na	20.1	21.8	na	19.9	22.1	na	10.6	14.5	na	15.7	24.6	na	17.4	20.5
PTSD symptoms (2 or more)	na	9.2	11.4	na	6.0	8.1	na	2.6	2.8	na	7.7	10.4	na	7.3	9.1
Depression symptoms (any)	na	30.6	32.6	na	22.8	24.8	na	13.2	13.8	na	26.2	31.1	na	25.6	27.6
Referral indicated by provider (any)	5.2	34.5	29.5	3.6	22.4	18.4	2.0	12.3	7.2	2.4	20.8	30.4	3.9	27.1	23.8
Mental health referral indicated[a]	1.4	7.3	16.3	0.5	3.0	5.8	0.5	1.6	2.2	0.2	2.2	6.0	1.0	5.1	11.0
Medical visit following referral[b]	99.2	99.8	98.4	87.9	89.1	94.2	85.2	96.0	97.6	50.6	79.0	94.7	92.1	96.5	97.4

Reserve component	Army			Navy			Air Force			Marine Corps			All service members		
	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900
	n=66,015	n=77,487	n=71,931	n=5,053	n=4,753	n=5,132	n=16,492	n=15,253	n=15,146	n=1,949	n=3,699	n=6,527	n=89,509	n=101,192	n=98,736
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
General health "fair" or "poor"	1.1	12.0	16.5	0.5	10.1	10.6	0.3	5.0	5.2	0.8	7.6	10.4	0.9	10.7	14.1
Health concerns, not wound or injury	16.4	35.6	42.8	1.4	32.7	31.6	0.6	9.7	15.3	1.7	23.2	35.7	12.3	31.1	37.5
Health worse now than before deployed	na	26.8	31.6	na	20.6	20.9	na	13.1	11.1	na	22.0	25.7	na	24.3	27.5
Exposure concerns	na	34.8	33.9	na	45.4	36.0	na	18.0	21.6	na	12.9	31.6	na	32.0	32.0
PTSD symptoms (2 or more)	na	9.6	18.2	na	6.2	12.8	na	3.0	3.1	na	5.4	13.8	na	8.3	15.3
Depression symptoms (any)	na	31.3	34.1	na	26.8	25.3	na	15.3	14.0	na	30.3	27.5	na	28.6	30.1
Referral indicated by provider (any)	3.7	37.7	38.6	3.6	30.2	25.1	0.4	16.8	9.2	2.2	31.1	34.5	3.0	33.9	33.1
Mental health referral indicated[a]	0.4	5.2	14.3	0.2	2.9	7.5	0.1	1.0	1.7	0.2	2.4	11.4	0.3	4.4	11.8
Medical visit following referral[b]	90.0	99.2	40.2	96.0	96.3	47.0	72.1	69.7	48.5	65.2	81.7	38.7	89.6	96.2	40.7

[a]Includes behavioral health, combat stress and substance abuse referrals.
[b]Record of inpatient or outpatient visit within 6 months after referral.

Figure 3. Proportion of service members who endorsed exposure concerns on post-deployment health assessments, U.S. Armed Forces, January 2004-November 2010

Sentinel reportable events among service members and beneficiaries at U.S. Army medical facilities, cumulative numbers[a] for calendar years through 30 November 2009 and 30 November 2010

Army

Reporting locations	Number of reports all events[b]		Food-borne						Vaccine preventable					
			Campylo-bacter		Salmonella		Shigella		Hepatitis A		Hepatitis B		Varicella[c]	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
NORTHERN														
Aberdeen Proving Ground, MD	45	35	.	.	.	.	.	.	1	.	.	.	.	.
Fort Belvoir, VA	247	200	9	10	4	8	.	6	.	.	.	.	.	.
Fort Bragg, NC	1,590	1,033	6	20	20	9	.	2	.	.	3	.	.	.
Fort Dix, NJ	0	0	.	.	.	.	.	.	.	.	.	.	.	.
Fort Drum, NY	54	89	.	.	.	.	.	.	.	.	.	.	.	.
Fort Eustis, VA	241	173	.	.	3	2	.	.	.	.	.	.	.	.
Fort George G Meade, MD	38	14	1	.	1	.	.	.	.	.	.	.	.	.
Fort Knox, KY	207	270	.	1	.	2	.	2	.	.	.	.	.	1
Fort Lee, VA	549	453	.	.	.	.	.	.	.	.	.	.	.	.
Fort Monmouth, NJ	49	36	.	.	.	1	.	.	.	1	2	1	.	.
Walter Reed AMC, DC	162	145	1	2	.	4	.	.	.	.	1	.	1	.
West Point Military Reservation, NY	107	57	1	.	.	2	.	.	.	.	1	.	.	.
SOUTHERN														
Fort Benning, GA	407	191	1	.	.	.	1	1	1	.	.	1	.	.
Fort Campbell, KY	371	509	.	1	.	7	.	3	.	.	.	.	1	.
Fort Gordon, GA	645	604	3	3	18	22	3	5	.	.	4	.	1	.
Fort Hood, TX	1,887	1,703	8	6	21	11	17	39	.	.	3	1	.	.
Fort Jackson, SC	580	431	.	.	.	.	.	.	.	.	2	.	.	.
Fort Polk, LA	588	334	.	.	2	2	3	3	.	.	.	.	.	.
Fort Rucker, AL	79	83	8	1	5	8	.	.	.	.	1	1	.	.
Fort Sam Houston, TX	556	414	1	.	7	13	2	2	.	.	1	1	1	.
Fort Sill, OK	624	397	.	.	.	.	4	1	.	.	.	.	.	.
Fort Stewart, GA	1,101	547	.	1	34	25	15	5	.	.	1	2	.	2
WESTERN														
Fort Bliss, TX	262	618	.	4	1	3	1	2	1	.	5	4	.	.
Fort Carson, CO	685	549	5	5	3	3	.	2	1	.	.	.	.	.
Fort Huachuca, AZ	78	79	1	.	.	2	.	.	.	.	.	.	.	.
Fort Leavenworth, KS	61	33	.	.	1	1	.	.	.	.	.	.	.	.
Fort Leonard Wood, MO	344	290	2	1	.	4	.	.	1	.	.	.	1	.
Fort Lewis, WA	1,012	716	6	8	8	3	1	2	.	1	.	.	.	.
Fort Riley, KS	358	337	1	2	3	1	.	2	.	.	.	.	.	.
Fort Wainwright, AK	197	263	.	2	.	.	.	.	.	.	.	.	.	.
NTC and Fort Irwin, CA	124	107	.	.	1	.	1	.	.	.	.	.	.	.
PACIFIC														
Hawaii	780	670	32	33	17	23	5	5	.	1	3	.	.	1
Japan	3	6	.	.	.	.	.	.	.	.	.	.	.	.
Korea	523	426	.	2	.	.	.	.	.	.	.	.	.	.
EUROPEAN														
Heidelberg	186	148	13	15	6	11	.	2	1	.	.	.	.	.
Landstuhl	610	365	3	2	3	2	1	4	.	.	1	2	1	.
Bavaria	419	512	6	4	8	7	.	.	.	.	.	.	.	.
CENTCOM LOCATIONS														
CENTCOM	212	190	1	.	.	2	1	.	1	.	.	1	.	.
Total	**15,981**	**13,027**	**109**	**123**	**166**	**178**	**55**	**88**	**7**	**3**	**28**	**14**	**6**	**4**

[a]Events reported by Dec 8, 2009 and 2010
[b]Sixty-seven medical events/conditions specified by Tri-Service Reportable Events Guidelines and Case Definitions, June 2009.
[c]Service member cases only.
Note: Completeness and timeliness of reporting vary by facility.

Sentinel reportable events among service members and beneficiaries at U.S. Army medical facilities, cumulative numbers[a] for calendar years through 30 November 2009 and 30 November 2010

Army

Reporting location	Arthropod-borne				Sexually transmitted						Environmental				Travel associated			
	Lyme disease		Malaria		Chlamydia		Gonorrhea		Syphilis		Cold[c]		Heat[c]		Q Fever		Tuberculosis	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
NORTHERN																		
Aberdeen Proving Ground, MD	.	.	.	.	37	29	5	6	2	.	.	.	.	.	.	.	.	.
Fort Belvoir, VA	.	.	.	1	216	152	18	23	.	.	.	.	.	.	.	.	.	.
Fort Bragg, NC	.	.	.	4	1,217	778	237	143	4	1	1	8	102	68	.	.	.	.
Fort Dix, NJ	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Fort Drum, NY	.	2	.	.	51	76	3	10	.	.	.	.	.	.	.	1	.	.
Fort Eustis, VA	.	1	.	.	205	148	33	16	.	2	.	.	.	4	.	.	.	.
Fort George G Meade, MD	1	.	.	.	35	8	.	6	.	.	.	.	.	.	.	.	.	.
Fort Knox, KY	1	.	2	1	181	239	23	17	.	.	.	.	.	6	.	.	.	1
Fort Lee, VA	1	1	.	.	496	410	50	41	2	.	.	.	.	1	.	.	.	.
Fort Monmouth, NJ	15	15	.	.	29	16	2	.	1	2	.	.	.	.	.	.	.	.
Walter Reed AMC, DC	10	9	.	2	120	99	17	20	11	7	.	.	.	1	.	.	1	1
West Point Military Reservation, NY	33	13	.	.	68	32	4	5	.	.	.	.	.	5	.	.	.	.
SOUTHERN																		
Fort Benning, GA	.	1	6	.	289	115	68	22	2	.	.	.	38	51	.	.	1	.
Fort Campbell, KY	5	.	1	.	254	447	64	42	1	.	.	.	45	9	.	.	.	.
Fort Gordon, GA	.	.	.	.	521	479	87	88	.	.	.	.	8	7	.	.	.	.
Fort Hood, TX	.	.	.	1	1,467	1,362	340	267	11	8	.	.	19	7	.	.	1	1
Fort Jackson, SC	.	1	.	.	321	209	50	30	2	1	.	8	205	182	.	.	.	.
Fort Polk, LA	.	.	.	1	384	246	63	38	1	1	.	.	135	43	.	.	.	.
Fort Rucker, AL	.	2	.	.	61	63	4	4	.	.	.	.	.	4	.	.	.	.
Fort Sam Houston, TX	.	1	.	1	431	338	84	48	11	10	.	.	17	.	.	.	1	.
Fort Sill, OK	.	.	.	1	554	297	44	47	1	1	.	.	21	50	.	.	.	.
Fort Stewart, GA	.	2	1	.	828	423	128	59	7	.	.	.	80	28	6	.	1	.
WESTERN																		
Fort Bliss, TX	.	.	.	3	215	513	33	77	5	5	.	.	.	6	.	.	1	1
Fort Carson, CO	.	.	2	2	611	500	63	37	.	.	.	.	.	.	.	.	.	.
Fort Huachuca, AZ	.	1	.	.	71	67	4	2	1	1	.	.	1	6	.	.	.	.
Fort Leavenworth, KS	4	1	.	.	50	28	3	2	2	1	.	.	1	.	.	.	.	.
Fort Leonard Wood, MO	.	.	.	.	299	244	31	33	.	.	1	.	8	7	.	.	1	1
Fort Lewis, WA	.	.	.	.	913	653	79	44	2	1	.	.	1	3	.	.	2	1
Fort Riley, KS	1	1	1	.	303	299	45	28	1	.	1	.	2	4	.	.	.	.
Fort Wainwright, AK	.	.	.	5	175	235	17	12	.	.	2	9	1	.	1	.	1	.
NTC and Fort Irwin, CA	.	.	.	.	110	97	6	7	2	1	.	.	4	2	.	.	.	.
PACIFIC																		
Hawaii	.	.	1	.	638	529	68	70	6	2	.	.	3	3	1	.	6	3
Japan	.	.	.	.	3	5	.	1	.	.	.	.	.	.	.	.	.	.
Korea	.	.	.	4	494	366	21	38	2	2	1	8	5	6	.	.	.	.
EUROPEAN																		
Heidelberg	11	7	.	.	136	96	18	16	.	1	.	.	.	.	.	.	1	.
Landstuhl	24	10	3	8	464	250	70	55	8	3	.	.	28	28	.	.	4	1
Bavaria	16	8	4	2	343	412	38	78	2	1	1	.	1	.	.	.	.	.
CENTCOM LOCATIONS																		
CENTCOM	1	.	.	3	192	161	13	18	1	4	.	.	.	.	2	1	.	.
Total	**123**	**76**	**21**	**39**	**12,782**	**10,421**	**1,833**	**1,450**	**88**	**55**	**7**	**33**	**725**	**531**	**10**	**2**	**21**	**10**

Sentinel reportable events among service members and beneficiaries at U.S. Navy medical facilities, cumulative numbers[a] for calendar years through 30 November 2009 and 30 November 2010

Navy

Reporting locations	Number of reports all events[b]		Food-borne						Vaccine preventable					
			Campylo-bacter		Salmonella		Shigella		Hepatitis A		Hepatitis B		Varicella[c]	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
NATIONAL CAPITOL AREA														
NNMC Bethesda, MD	160	161	3	3	2	4	.	3	3	1	5	21	.	.
NHC Annapolis, MD	8	29	.	.	.	.	.	.	.	.	.	1	.	.
NHC Patuxent River, MD	28	14	.	.	.	2	.	.	.	.	.	.	.	.
NHC Quantico, VA	103	90	1	.	1	.	3	.	.	.	.	1	.	.
NAVY MEDICINE EAST														
NH Beaufort, SC	392	67	.	.	.	.	.	.	1	.	5	.	.	1
NH Camp Lejeune, NC	553	489	1	.	14	19	1	1	.	.	.	1	.	.
NH Charleston, SC	3	0	.	.	.	.	.	.	.	.	.	.	.	.
NH Cherry Point, NC	3	0	.	.	.	.	.	.	.	.	.	.	.	.
NH Corpus Christi, TX	3	11	.	.	.	.	.	1	.	.	.	.	.	.
NHC Great Lakes, IL	434	496	.	.	1	.	.	.	1	.	12	4	.	1
NH Guantanamo Bay, Cuba	0	0	.	.	.	.	.	.	.	.	.	.	.	.
NH Jacksonville, FL	244	189	.	3	17	21	1	.	.	.	.	7	.	.
NH Naples, Italy	1	0	.	.	.	.	.	.	.	.	.	.	.	.
NHC New England, RI	0	0	.	.	.	.	.	.	.	.	.	.	.	.
NH Pensacola, FL	229	114	1	1	8	2	2	.	.	.	.	.	.	.
NMC Portsmouth, VA	184	336	.	.	.	6	.	.	.	.	1	4	.	1
NH Rota, Spain	0	0	.	.	.	.	.	.	.	.	.	.	.	.
NH Sigonella, Italy	1	2	.	.	.	.	.	.	.	.	.	.	1	.
NAVY MEDICINE WEST														
NH Bremerton, WA	6	3	.	.	.	.	.	.	.	.	.	1	.	.
NH Camp Pendleton, CA	6	1	.	.	.	.	.	.	.	.	.	.	.	.
NH Guam-Agana, Guam	31	90	.	.	3	1	.	.	.	.	.	.	.	.
NHC Hawaii, HI	20	452	.	5	.	3	.	.	.	.	.	.	.	.
NH Lemoore, CA	48	65	.	.	.	.	.	.	.	.	.	.	.	.
NH Oak Harbor, WA	104	66	3	1	2	.	1	.	.	.	4	4	1	.
NH Okinawa, Japan	39	251	.	.	.	3	.	.	.	.	.	1	.	.
NMC San Diego, CA	809	992	8	9	12	12	1	2	.	.	61	24	1	.
NH Twentynine Palms, CA	1	3	.	.	.	.	.	.	.	.	.	.	.	.
NH Yokosuka, Japan	35	59	.	.	.	.	.	.	.	.	3	1	.	.
NAVAL SHIPS														
COMNAVAIRLANT/CINCLANTFLEET	22	24	.	.	.	.	.	.	.	.	.	.	.	.
COMNAVSURFPAC/CINCPACFLEET	75	35	.	.	.	.	.	.	.	.	.	.	.	.
OTHER LOCATIONS														
Other	3,372	3,318	17	13	23	53	5	19	1	.	12	24	2	7
Total	**6,914**	**7,357**	**34**	**35**	**83**	**126**	**14**	**26**	**6**	**1**	**103**	**94**	**5**	**10**

[a]Events reported by Dec 8, 2010
[b]Sixty-seven medical events/conditions specified by Tri-Service Reportable Events Guidelines and Case Definitions, June 2009.
[c]Service member cases only.
Note: Completeness and timeliness of reporting vary by facility.

Sentinel reportable events among service members and beneficiaries at U.S. Navy medical facilities, cumulative numbers[a] for calendar years through 30 November 2009 and 30 November 2010

Navy

Reporting location	Arthropod-borne				Sexually transmitted						Environmental				Travel associated			
	Lyme disease		Malaria		Chlamydia		Gonorrhea		Syphilis		Cold[c]		Heat[c]		Q Fever		Tuberculosis	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
NATIONAL CAPITOL AREA																		
NNMC Bethesda, MD	12	25	.	2	125	66	9	11	1	23	.	.	.	.	.	1	.	1
NHC Annapolis, MD	.	2	.	.	7	25	.	.	1	1	.	.	.	.	.	.	.	.
NHC Patuxent River, MD	6	2	.	.	18	8	3	2	1	.	.	.	.	.	.	.	.	.
NHC Quantico, VA	1	1	.	.	77	49	10	4	.	.	.	6	10	29	.	.	.	.
NAVY MEDICINE EAST																		
NH Beaufort, SC	.	.	.	.	367	60	18	6	1	.	.	.	.	.	.	.	.	.
NH Camp Lejeune, NC	3	7	2	3	381	348	85	49	.	1	1	2	62	56	2	2	1	.
NH Charleston, SC	.	.	.	.	2	.	1	.	.	.	.	.	.	.	.	.	.	.
NH Cherry Point, NC	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.
NH Corpus Christi, TX	.	2	.	.	3	7	.	1	.	.	.	.	.	.	.	.	.	.
NHC Great Lakes, IL	1	2	.	.	386	443	29	39	.	3	.	.	3	2	.	1	1	1
NH Guantanamo Bay, Cuba	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
NH Jacksonville, FL	1	2	1	.	204	136	20	14	.	2	.	.	.	3	.	.	.	1
NH Naples, Italy	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
NHC New England, RI	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
NH Pensacola, FL	.	1	.	.	176	99	24	9	1	2	.	.	14	.	2	.	1	.
NMC Portsmouth, VA	.	10	4	4	141	244	32	49	4	13	.	.	.	2	.	.	2	3
NH Rota, Spain	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
NH Sigonella, Italy	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.
NAVY MEDICINE WEST																		
NH Bremerton, WA	.	.	.	.	6	2	.	.	.	.	.	.	.	.	.	.	.	.
NH Camp Pendleton, CA	.	.	.	.	6	1	.	.	.	.	.	.	.	.	.	.	.	.
NH Guam-Agana, Guam	.	.	.	.	24	76	3	12	.	1	.	.	.	.	.	.	1	.
NHC Hawaii, HI	.	.	.	.	19	403	1	40	.	1	.	.	.	.	.	.	.	.
NH Lemoore, CA	1	.	.	.	42	62	5	3	.	.	.	.	.	.	.	.	.	.
NH Oak Harbor, WA	1	.	.	1	90	55	2	3	.	1	.	1	.	.	.	.	.	.
NH Okinawa, Japan	.	.	.	1	39	208	.	19	.	.	.	.	.	17	.	1	.	1
NMC San Diego, CA	3	2	3	1	587	808	87	81	18	26	.	.	22	27	2	.	4	.
NH Twentynine Palms, CA	.	.	.	.	.	2	.	1	1	.	.	.	.	.	.	.	.	.
NH Yokosuka, Japan	1	.	.	.	31	55	.	2	.	1	.	.	.	.	.	.	.	.
NAVAL SHIPS																		
COMNAVAIRLANT/CINCLANTFLEET	.	.	1	.	21	18	.	6	.	.	.	.	.	.	.	.	.	.
COMNAVSURFPAC/CINCPACFLEET	.	.	.	.	64	31	10	4	1	.	.	.	.	.	.	.	.	.
OTHER LOCATIONS																		
Other	30	44	8	39	2,748	2,234	345	499	11	22	9	10	156	347	.	1	5	6
Total	**60**	**100**	**19**	**51**	**5,568**	**5,442**	**684**	**854**	**40**	**97**	**10**	**19**	**267**	**483**	**6**	**6**	**15**	**13**

Sentinel reportable events among service members and beneficiaries at U.S. Air Force medical facilities,[a] cumulative numbers for calendar years through 30 November 2009 and 30 November 2010[b]

Air Force

Reporting locations	Number of reports all events[b]		Food-borne						Vaccine preventable					
			Campylo-bacter		Salmonella		Shigella		Hepatitis A		Hepatitis B		Varicella[d]	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Air Combat Cmd	1,381	1,549	6	2	17	19	2	3	2	2	6	18	3	3
Air Education & Training Cmd	1,502	1,371	5	12	23	23	7	5	3	3	13	21	.	2
Air Force Dist. of Washington	181	175	.	4	2	.	.	1	.	.	4	2	.	.
Air Force Materiel Cmd	560	574	4	5	17	17	.	1	1	1	10	1	.	.
Air Force Special Ops Cmd	178	180	1	1	13	19	.	1	.	.	.	1	.	.
Air Force Space Cmd	342	310	2	.	8	7	.	.	1	1	2	2	.	.
Air Mobility Cmd	772	726	4	5	10	10	5	1	1	3	10	9	1	.
Pacific Air Forces	543	833	4	4	7	9	.	2	.	3	6	4	3	1
U.S. Air Forces in Europe	573	505	4	4	7	9	.	.	.	.	5	1	1	6
U.S. Air Force Academy	69	78	1	.	3	2	.	.	.	.	1	2	.	.
Other	82	57	1	1	4	5	.	2	.	.	.	.	.	.
Total	**6,183**	**6,358**	**32**	**38**	**111**	**120**	**14**	**16**	**8**	**13**	**57**	**61**	**8**	**12**

[a]AFRESS data interruption occured in August/September of 2010 during scheduled relocation of USAFSAM servers.
[b] Events reported by Dec 8, 2010
[c]Sixty-seven medical events/conditions specified by Tri-Service Reportable Events Guidelines and Case Definitions, June 2009.
[d]Service member cases only.
Note: Completeness and timeliness of reporting vary by facility.

Reporting location	Arthropod-borne				Sexually transmitted						Environmental				Travel associated			
	Lyme disease		Malaria		Chlamydia		Gonorrhea		Syphilis		Cold[d]		Heat[d]		Q Fever		Tuberculosis	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Air Combat Cmd	13	10	.	2	1,212	1,339	103	121	6	6	5	5	5	18	.	.	1	1
Air Education & Training Cmd	7	2	4	2	1,281	1,161	139	130	7	4	3	.	9	4	.	.	1	2
Air Force Dist. of Washington	8	7	.	.	155	137	12	20	.	.	.	.	.	4	.	.	.	.
Air Force Materiel Cmd	11	6	.	2	472	485	40	47	3	2	.	.	2	7	.	.	.	.
Air Force Special Ops Cmd	1	.	.	1	150	149	11	4	1	1	1	1	.	.	.	1	.	1
Air Force Space Cmd	1	1	.	2	309	280	16	15	1	.	.	1	1	1	.	.	1	.
Air Mobility Cmd	24	19	1	2	640	610	56	53	2	3	15	7	1	3	1	.	1	1
Pacific Air Forces	1	1	1	1	450	737	51	60	4	1	10	.	6	8	.	.	.	2
U.S. Air Forces in Europe	20	25	2	2	485	413	44	41	2	2	1	.	.	1	.	.	2	1
U.S. Air Force Academy	1	2	1	1	58	68	4	3	.	.	.	.	.	.	.	.	.	.
Other	.	1	5	1	42	39	7	2	.	1	1	1	20	2	1	2	1	.
Total	**87**	**74**	**14**	**16**	**5,254**	**5,418**	**483**	**496**	**26**	**20**	**36**	**15**	**44**	**48**	**2**	**3**	**7**	**8**

Deployment-related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003 - November 2010 (data as of 29 December 2010)

Traumatic brain injury (ICD-9: 310.2, 800-801, 803-804, 850-854, 907.0, 950.1-950.3, 959.01, V15.5_1-9, V15.5_A-F, V15.59_1-9, V15.59_A-F)[a]
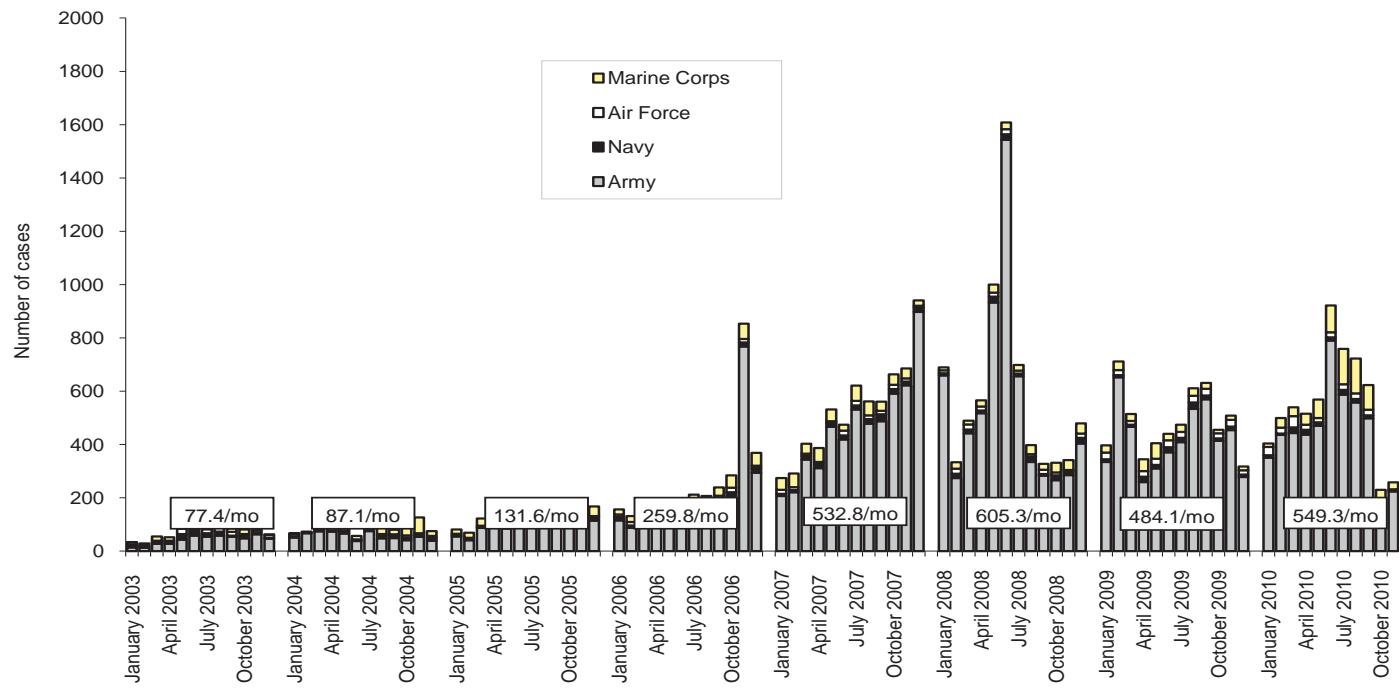
Reference: Armed Forces Health Surveillance Center. Deriving case counts from medical encounter data: considerations when interpreting health surveillance reports. *MSMR*. Dec 2009; 16(12):2-8.
[a]Indicator diagnosis (one per individual) during a hospitalization or ambulatory visit while deployed to/within 30 days of returning from OEF/OIF. (Includes in-theater medical encounters from the Theater Medical Data Store [TMDS] and excludes 2,590 deployers who had at least one TBI-related medical encounter any time prior to OEF/OIF).

Deep vein thrombophlebitis/pulmonary embolus (ICD-9: 415.1, 451.1, 451.81, 451.83, 451.89, 453.2, 453.40 - 453.42 and 453.8)[b]
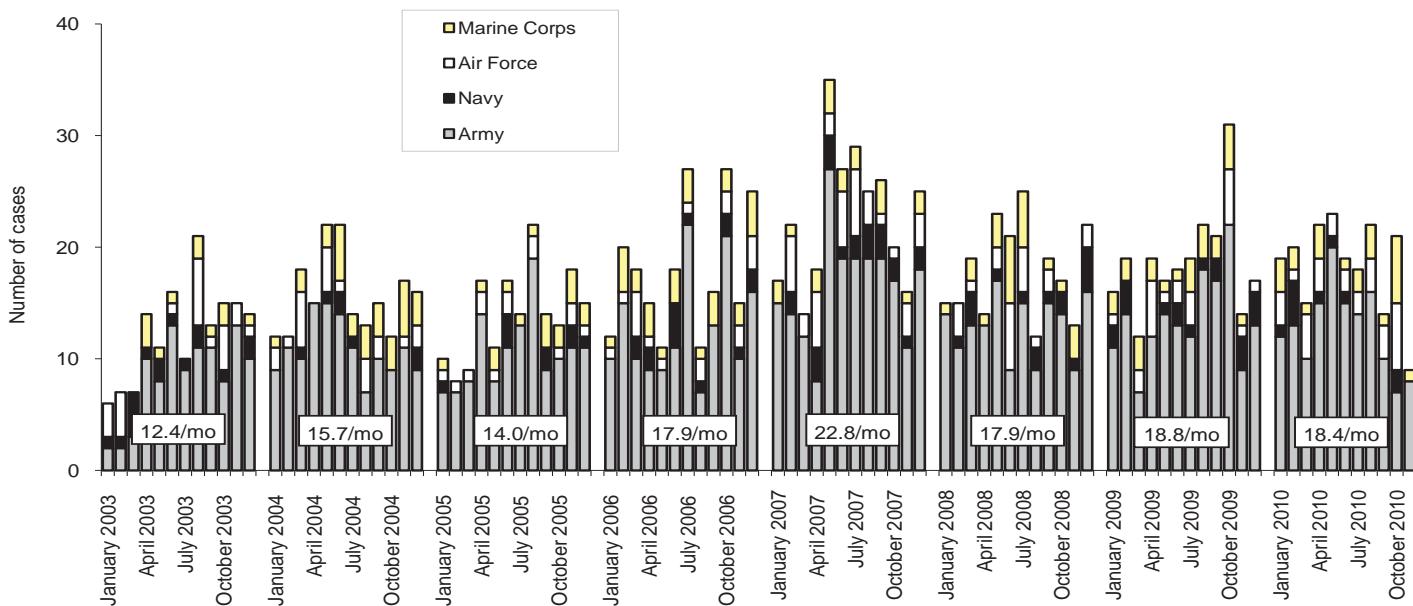
Reference: Isenbarger DW, Atwood JE, Scott PT, et al. Venous thromboembolism among United States soldiers deployed to Southwest Asia. *Thromb Res*. 2006;117(4):379-83.
[b]One diagnosis during a hospitalization or two or more ambulatory visits at least 7 days apart (one case per individual) while deployed to/within 90 days of returning from OEF/OIF.

Deployment-related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003 - November 2010 (data as of 29 December 2010)

Amputations (ICD-9: 887, 896, 897, V49.6 except V49.61-V49.62, V49.7 except V49.71-V49.72, PR 84.0-PR 84.1, except PR 84.01-PR 84.02 and PR 84.11)[a]
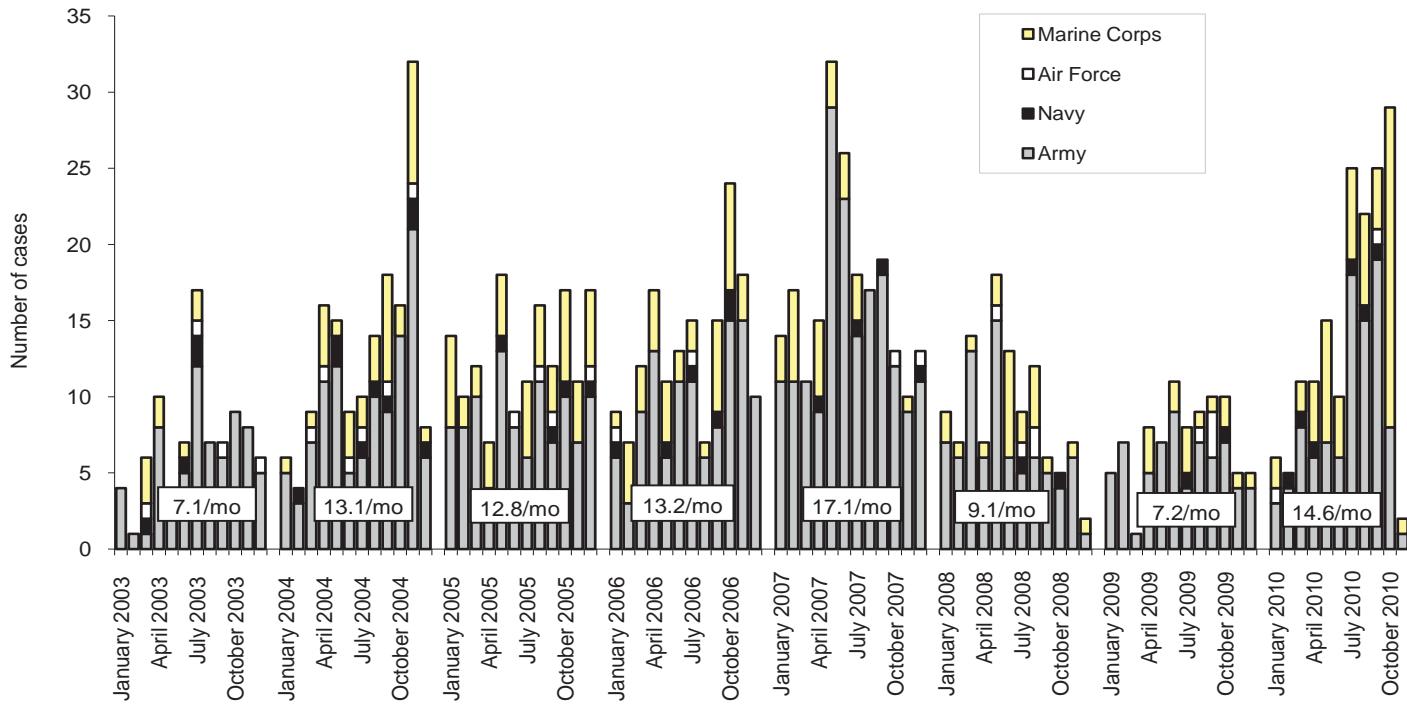
Reference: Army Medical Surveillance Activity. Deployment-related condition of special surveillance interest: amputations. Amputations of lower and upper extremities, U.S. Armed Forces, 1990-2004. *MSMR.* Jan 2005;11(1):2-6.
[a]Indicator diagnosis (one per individual) during a hospitalization while deployed to/within 365 days of returning from OEF/OIF.

Heterotopic ossification (ICD-9: 728.12, 728.13, 728.19)[b]
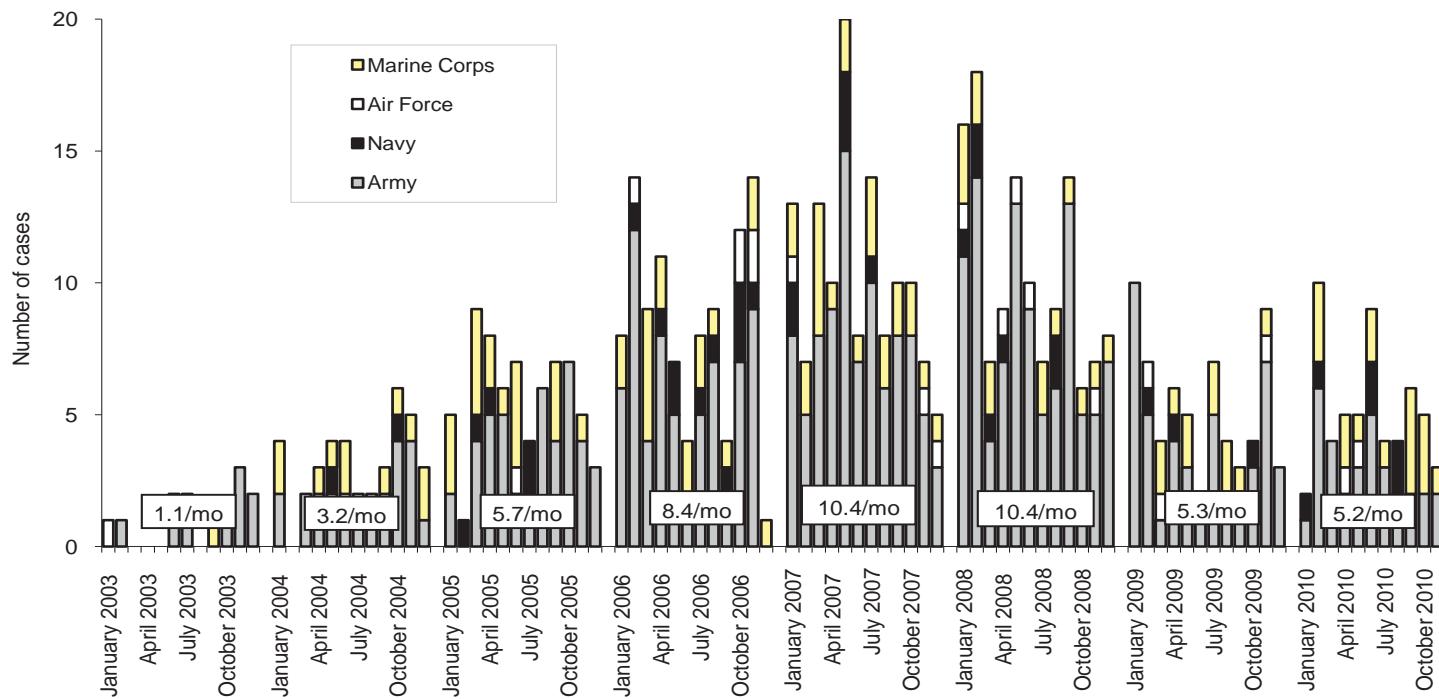
Reference: Army Medical Surveillance Activity. Heterotopic ossification, active components, U.S. Armed Forces, 2002-2007. *MSMR.* Aug 2007; 14(5):7-9.
[b]One diagnosis during a hospitalization or two or more ambulatory visits at least 7 days apart (one case per individual) while deployed to/within 365 days of returning from OEF/OIF.

Deployment-related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003 - November 2010 (data as of 29 December 2010)

Severe acute pneumonia (ICD-9: 518.81, 518.82, 480-487, 786.09)[a]
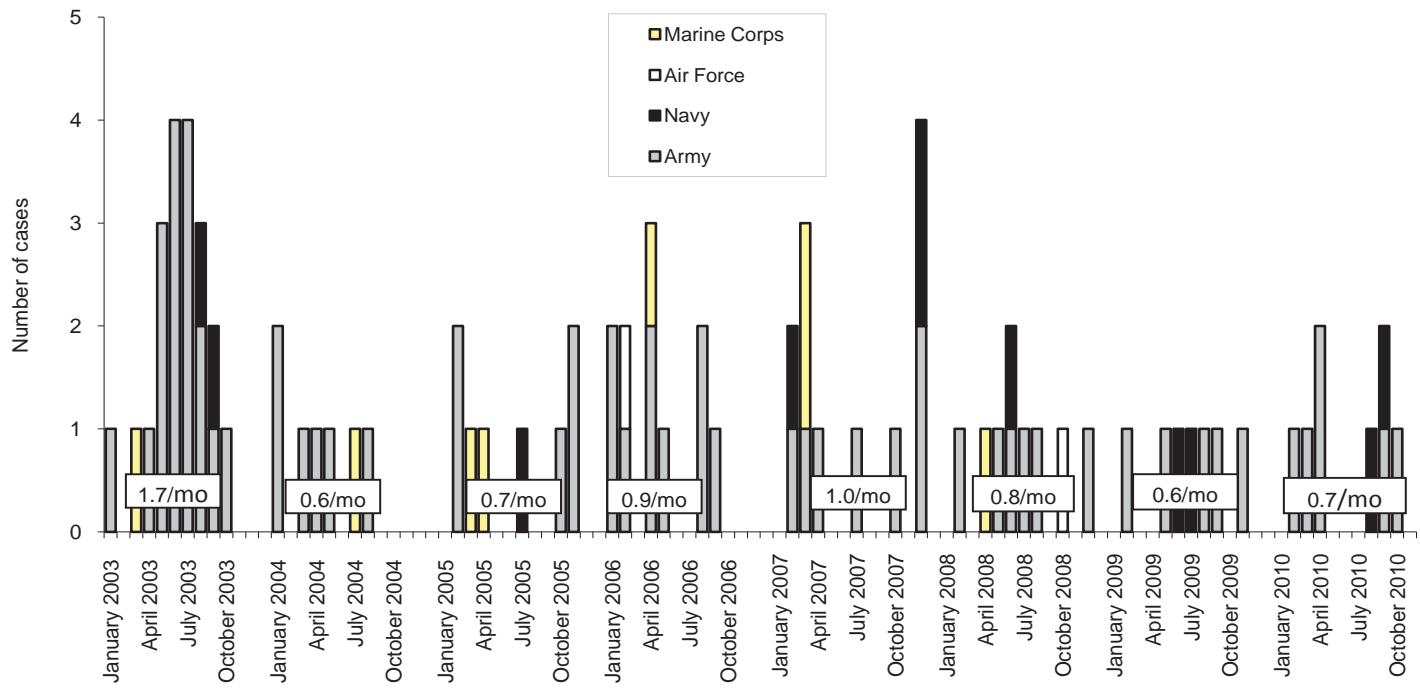
Reference: Army Medical Surveillance Activity. Deployment-related condition of special surveillance interest: severe acute pneumonia. Hospitalizations for acute respiratory failure (ARF)/acute respiratory distress syndrome (ARDS) among participants in Operation Enduring Freedom/Operation Iraqi Freedom, active components, U.S. Armed Forces, January 2003-November 2004. *MSMR*. Nov/Dec 2004;10(6):6-7.
[a]Indicator diagnosis (one per individual) during a hospitalization while deployed to/within 30 days of returning from OEF/OIF.

Leishmaniasis (ICD-9: 085.0 to 085.9)[b]
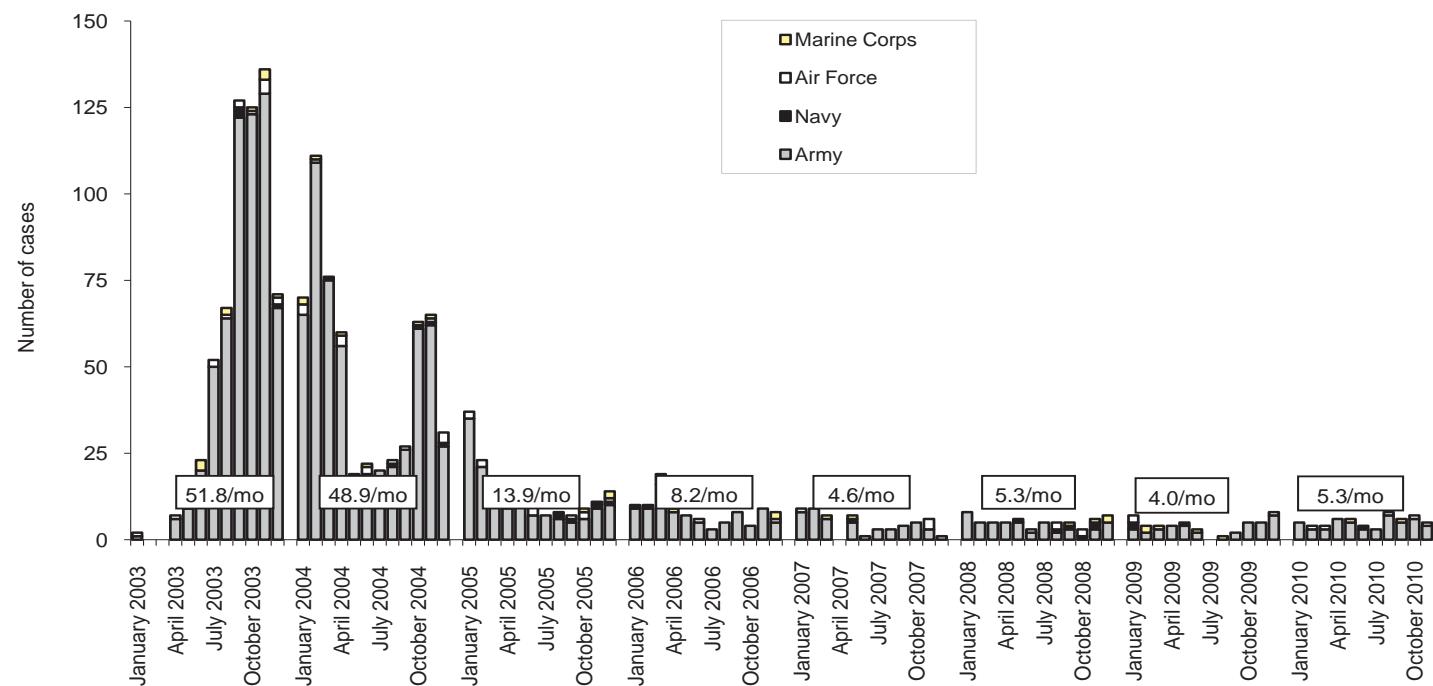
Reference: Army Medical Surveillance Activity. Deployment-related condition of special surveillance interest: leishmaniasis. Leishmaniasis among U.S. Armed Forces, January 2003-November 2004. *MSMR*. Nov/Dec 2004;10(6):2-4.
[b]Indicator diagnosis (one per individual) during a hospitalization, ambulatory visit, and/or from a notifiable medical event during/after service in OEF/OIF.